PAPER TRADE
JOURNAL

March 27, 1953

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- **COLORS THAT PERFORM DEPENDABLY**

IF you are concerned with selection of colors for facial tissues you'll welcome Geigy's Circular #328-D. It lists *only* those dyestuffs specifically suited for absorbent papers. There is nothing to hamper a quick decision. Performance of each color shown has been thoroughly demonstrated in practice.

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Diphenyl Fast Orange W S
Direct Pink E G Extra
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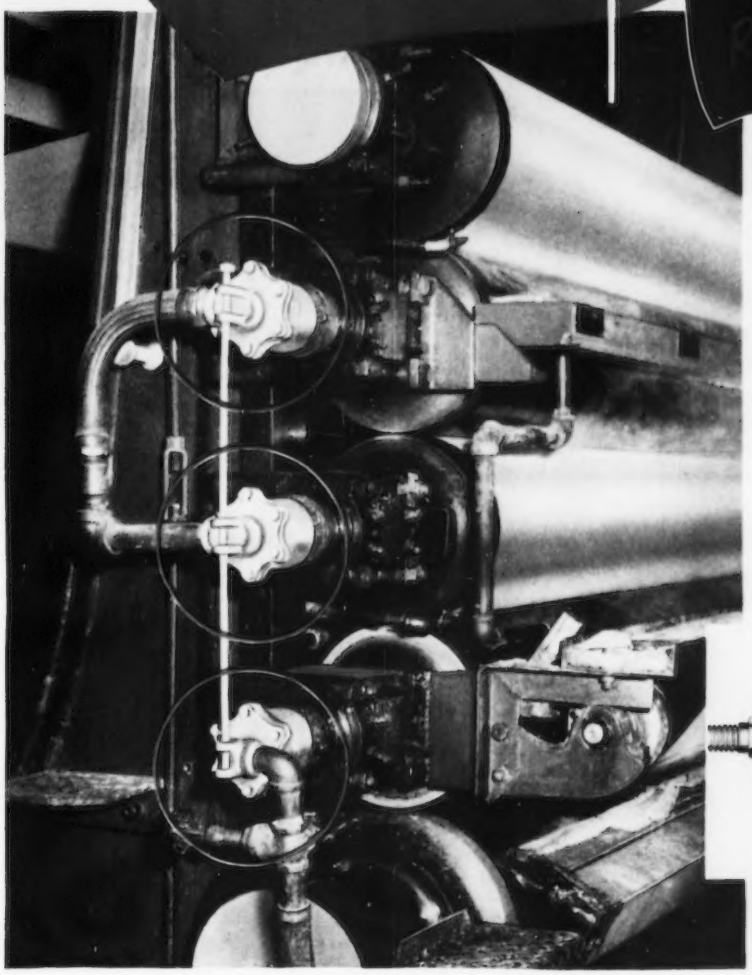
No Support Problem Here!

TYPE "S"

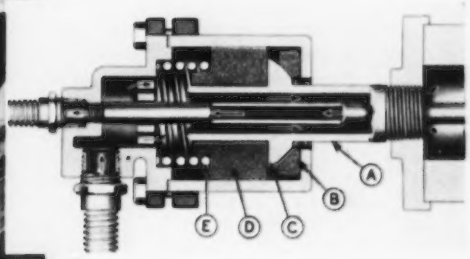
JOHNSON Rotary Pressure JOINTS



Type "S" Johnson Rotary Pressure Joints installed on a paper calender in a large midwestern mill. This is typical of the growing use of the Type "S" on machines of this kind throughout the paper industry.

Completely self-supporting, the Type "S" Johnson Joint is an ideal answer where ordinary methods of support are unsuitable. It is perfect for those jobs on which the Type "L" cannot be adopted.

The Type "S", like all Johnson Joints, is completely packless, self-lubricating and self-adjusting — quickly pays for itself out of increased efficiency and lower maintenance costs. And, since it is self supporting, the Type "S" shifts with the roll — completely eliminating the troubles of misalignment. Find out how easily you can switch over to the Type "S"; write today for complete information.



Completely Self-Supporting

Nipple (A) is connected to roll. Carbon-graphite seal ring (B) rotates against convex surface of collar (C). Joint assembly is supported by guide (D), also of self-lubricating carbon-graphite. Spring (E) is for initial seating only.

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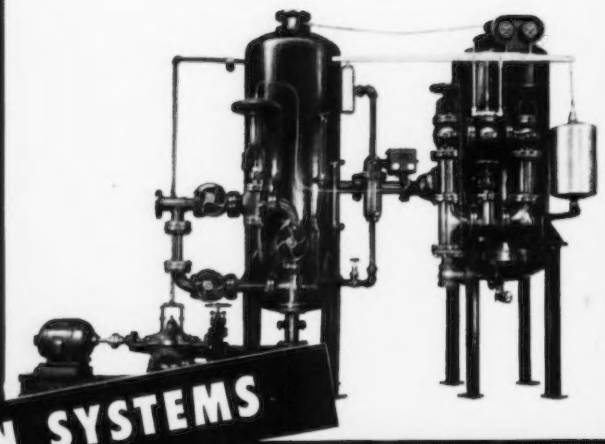
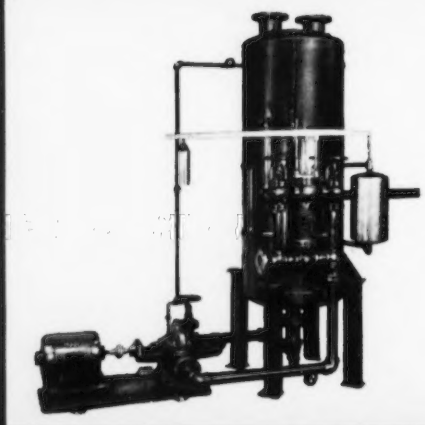
Direct Operated Solenoid Valves • "Instant" Steam Water Heaters



TYPICAL FULTON SYSTEMS

FOR SMALLER MACHINES

FOR OLDER MACHINES



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DAYTON, OHIO

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JOHN C. W. EVANS
EDITOR

D. BRUCE OTIS, JR.
ASSOCIATE EDITOR

E. P. NUTTALL
ASSOCIATE EDITOR

R. E. THUEMMES
MANAGING EDITOR

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REMEMBER THESE DATES

APRIL 26-29: American Institute of Chemical Engineers, Joint Meeting with Chemical Institute of Canada, Royal York Hotel, Toronto, Canada.

MAY 18, 19, 20: National Paperboard Assn., Spring Meeting, Santa Barbara Biltmore Hotel, Santa Barbara, Calif.

MAY 21-22: Measurement & Control Conference sponsored by TAPPI Engineering Div., TAPPI Lake Erie Section, Cleveland Section of American Society of Quality Control and Cleveland Section of Instrument Society of America; Carter Hotel, Cleveland, Ohio.

MAY 25-27: TAPPI Fourth Coating Conference, Netherland Plaza Hotel, Cincinnati, Ohio.

JUNE 4-6: Technical Section, C.P.P.A., Saranac Inn, Saranac, N.Y.

JUNE 9-11: American Pulp and Paper Mill Supts. Assn., National Meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

JUNE 15-17: Forest Products Research Society, 7th National Annual Meeting, Memphis, Tenn.

OCT. 26-29: TAPPI Engineering Division, Sheraton-Mount Royal Hotel, Montreal, Que., Canada.

PAPER TRADE JOURNAL

MARCH 27, 1953, *Vol. 136, No. 13*

Full Production at Calcasieu In Spite of Strike 11

Hudson Repossesses Lansdowne Paper 11

Oxford Denies Cut-Back Rumors 11

Greco Buys Albia Mill 12

Elk Falls Expansion 12

Waste Paper Utilization Problems 14

Selection of Technical Personnel 17

The Oxidation of Sulphate Black Liquor 19

Bids and Awards 24

Local Meeting Calendar 40

DEPARTMENTS

Our Business	7	Association News	38
Trends	9	Prices	45
News of the Week	11	Prices of Materials	45
Paper People	34	News of Suppliers	46
Obituaries	36	World News and Markets	48
New Literature	36	Production Ratio	50
CLASSIFIED ADVERTISING	51	ADVERTISERS INDEX	62

THIS WEEK—*Henry Perry gets down to brass tacks on the Problems of Waste Paper Utilization. We also report J. E. Todd's advice on the Selection of Technical Personnel and we offer the concluding half of T. T. Collins review of the literature on Oxidation of Sulphate Black Liquor.*

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GEORGE E. LOCKWOOD, President and Treasurer
Phone: Plaza 7-2370
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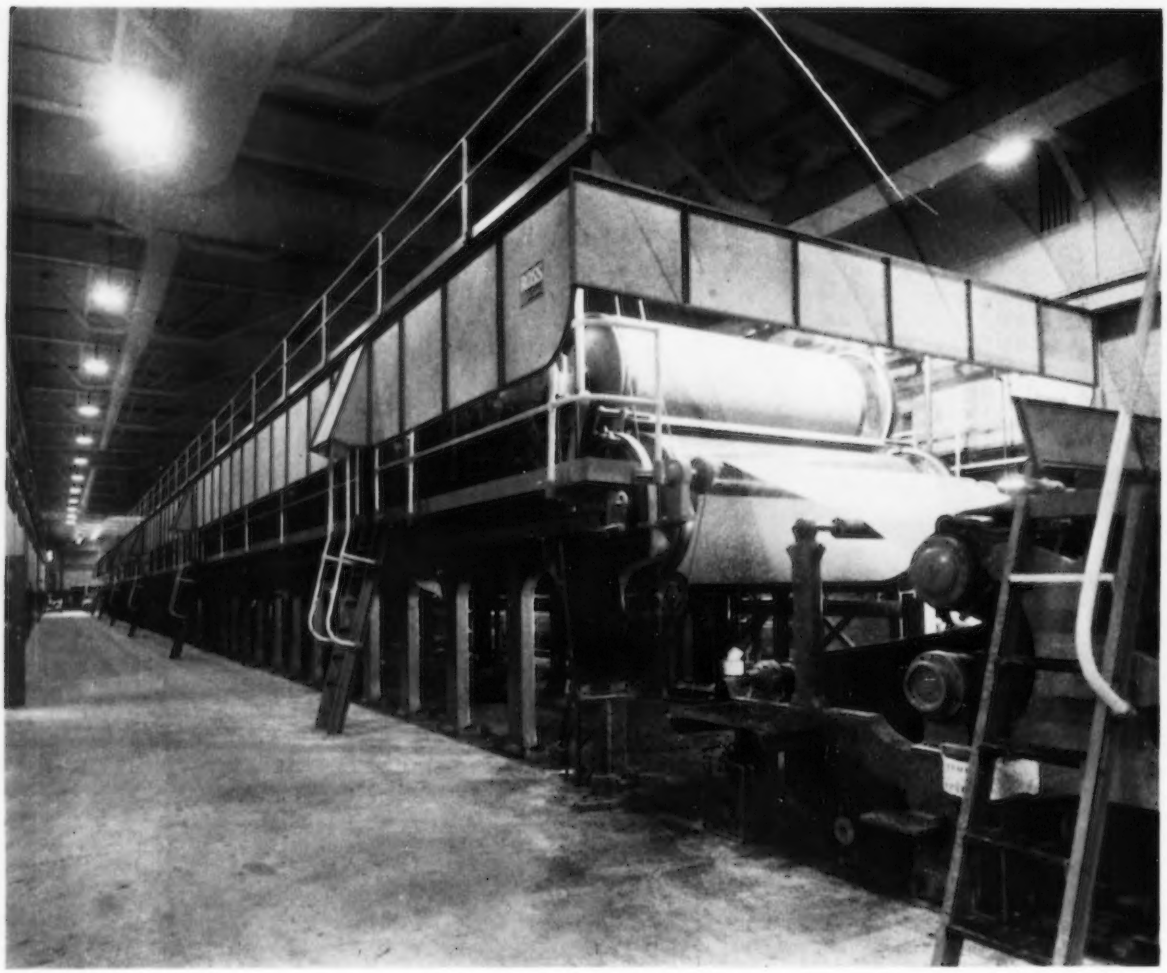


A STEP AHEAD IN DRYER DESIGN

Here is a dryer section that employs "high type" frames to eliminate the conventional pit—usually mussy—always inconvenient.

Another feature of note is the full length foot walks, front and back.

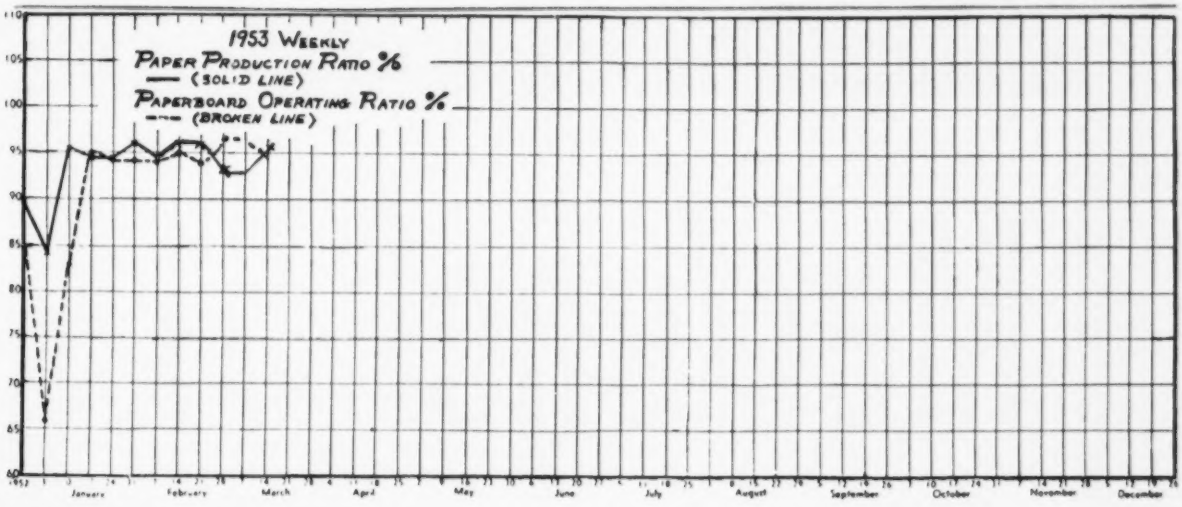
The vat, press and finishing sections that go to complete the installation also carry the very latest of modern features, all combining into the outstanding machine of the past year.

Paper machine by Black-Clawson . . . Preparation system by Shartle.

BLACK-CLAWSON

THE BLACK CLAWSON COMPANY • HAMILTON, OHIO

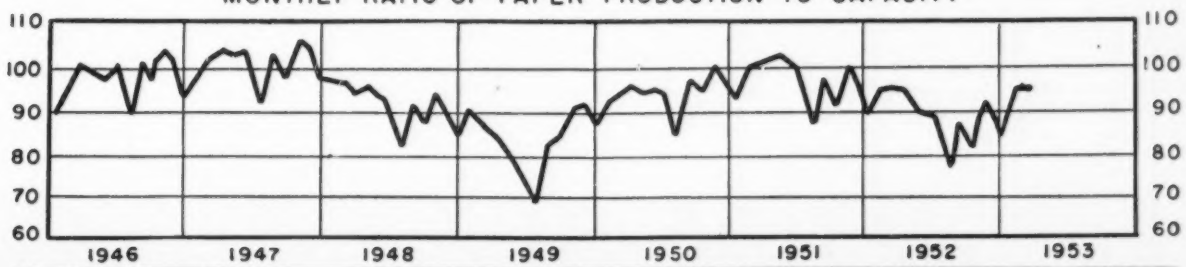
OUR BUSINESS



Brief of Important Figures

Source	Production	WEEK ENDING Mar. 14, '53	Feb. 14, '53	Mar. 15. '52
APPA	Paper Production Percent Capacity[3]	96.3	95.3	94.5
NPA	Paperboard Operating Ratio Percent Inch Hours	94	95	85
		Jan. 1953	**Dec. 1952x**	**Jan. 1952**
APPA	Paper Production* (Except Newsprint and Building Papers) ....Tons	872,000	797,624	917,000
	New Orders ....Tons	890,000	821,731	963,000
	Unfilled Orders ....Tons	815,295	793,397	935,000
	Shipments ....Tons	868,000	793,778	899,000
		Feb. 1953	**Jan. 1953**	**Feb. 1952**
NPA	Paperboard Production ....Tons	973,807	985,529	832,695
	New Orders ....Tons	968,697	971,844	783,773
	Unfilled Orders ....Tons	437,345	455,086	355,197
	Our Customers Activities Index[1]	**Latest Mo.°**	**Previous Mo.°**	**Year Ago°**
FRS	Durable Mfg. Index	311	305	280
	Nondurable Mfg. Index	193	199	185
	Printing and Publishing Index	172	183	178
ODC	Magazine Advg.-Printer's Ink Index	394	408	357
	Prices Index			
BLS	Consumers Price Index[1]	190.7	191.1	189.1
	Wholesale all Commodities[4]	109.6	110.7	113.5
	Wholesale Pulp, Paper[4] and Allied Products	115.9	115.5	118.4
	Purchasing Power of Dollar, Consumers Prices[1]	52.4	52.3	52.9
	General Activity Index			
FRS	Mfg. Production-Worker Payroll[4]	148.8	145.3	132.9
	Unemployment Compensation Initial Claims (M)	1,126	690	1,152

MONTHLY RATIO OF PAPER PRODUCTION TO CAPACITY



[1] 1935-39 = 100 Unadjusted Index.
[3] New 6-7 day basis.
[4] New Index 1947-1949 = 100.

* For details see APPA Monthly Statistical Summary—January 1953 Estimated Figures.
° Latest Month Available on Request.
x Revised Figures. N.A.: Not available.

Merfenel 51*

*PACKED IN ONE AND TWO OUNCE ENVELOPES

A new Product

FOR
SLIME CONTROL
•
MOLD PROOFING
•
PRESERVATION OF
STARCHES AND PROTEINS

R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.

Price Controls Ended

Sulphur, soda ash advance . . . . .

Seventh and final step to terminate price controls was announced by OPS on March 17. Earlier orders which had gradually terminated controls on a range of commodities and services had excepted some chemicals and industrials materials, including sulphur and sulphuric acid. Other papermaking chemicals were decontrolled earlier in the month. Amendment 1 to GOR 44 ends all price controls.

Sulphur price rise announced . . . .

A major producer of the important papermaking sulphur last week announced a price rise of $3.50 per long ton—from $22 to $25.50 f.o.b. Hoskins Mound, Tex.; from $23.50 to $27.50 at Port Sulphur, Tex.; and from $26.50 to $30 f.a.s. Gulf ports.

Though the rises are understood to be immediately effective, domestic accounts have contracts containing 30 to 60 day clauses. Exports are not so protected, and the advance is now in effect.

To press time, other producers had not made public their plans for a similar price rise. Indications are that a rise can be expected.

Soda Ash Up 15 Cents . . . . . .

A lift of 15 cents a hundred pounds in the price of soda ash becomes effective April 1. The advance is believed to be across the board.

Chlorine advance rescinded . . . .

The 20 cents per hundred pound rise in chlorine scheduled to become effective May 1 with most producers has been rescinded. For the time being at least, there is no change from the price which had been effective under OPS, for which see *Prices* page.

No Additional Pulp News

There is little to add to the information on next quarter pulp prices furnished last week. (See Table).

The big unknown to press time was the Canadian unbleached sulphite. If anyone knows a price for any brand, it is a well-kept secret.

Obviously, as earlier stated, the Canadians do not want further to reduce their price from $130, delivered basis. But with $110, on dock, the prevailing price for Scandinavian grades, their hands appear to be forced in this seesaw battle for market position.

Canadian paper market reported . .

Trends in Canada's paper market which could react on the Canadian pulp price are these:

During the past months, says the JOURNAL's Ottawa correspondent, there has been a stronger demand for kraft and sulphite pulp, with fine paper mills reporting strengthening factors and increased evidence that inventories can be considered in balance, according to February release of the Purchasing Agents Assn., Toronto.

The new freight rate increase of 7 percent which became effective March 16—the fifth since the war and the second in three months—has again added to operating costs. A further 9 percent general increase also is before the Board of Transport Commissioners.

PAPER TRADE JOURNAL TRENDS

Cotton Linters Markets Quiet

Cotton linters markets for the week ended March 19 were quiet. Inquiries, mostly for second cuts, were fairly numerous; offerings of second cuts limited in volume, offerings of felting grades moderate. Sales volume was comprised mostly of small lots for nearby needs, reports the USDA.

Consumption of cotton linters during February amounted to 110,000 bales, compared with 111,000 in January, and 120,000 bales in February 1952. Consumption during February for the last 10 years averaged 107,000 bales, according to Census figures.

Bleached consumption of cotton linters in February totaled 62,000 bales, compared against 69,000 in January and 76,000 bales in February a year ago.

Drop in rag use studied by dealers . .

Data compiled from Census figures shows that use of rags in the production of paper and board shows a downward trend, at the same time as output of the end product was either holding its own or increasing. C. V. Maudlin, Washington representative of the NAWMD told the 40th Annual Convention of dealers meeting in Chicago's Conrad Hilton Hotel last week. Consumption figures compared for the years 1950 and 1952 show a decrease of 26.6 percent.

Some writers, Mr. Maudlin said, have attributed this drop in rag use to an increased use of cotton linters and linter pulp. The facts are that the use of cotton fiber (which includes cotton linters) in paper and board manufacture dropped from 21,286 short tons in 1950 to 14,044 short tons in 1952, a decrease of 34.0 percent. Data on the amount used in the manufacture of paper during 1952 are estimated to be 9,000 short tons, a decrease of 31.3 per cent from 1950's 13,103 short tons.

Consumption of cotton linter pulp is combined in Census data with miscellaneous fibrous materials and statistics are not available. It is probable, Mr. Maudlin told the dealers, that any increase in the use of linters in the manufacture of paper and board is in the form of linter pulp. Processes for improving linter pulps are now being studied, and it is estimated that the paper industry alone could use approximately 50,000 tons of cotton linters a year as a substitute for cotton rags.

In an address prepared by W. D. Munson, Southern Cotton Chemical Co., and read by Carlton B. Overton, Castle & Overton, Inc., New York, the Rag Cotton Council heard a full presentation of cotton linter usage in paper making which assured them that the use of cotton linter pulp is comparatively limited as a filler or extender or to the imparting of certain qualities to the paper such as bulk, opacity, absorbency, special finish or other special attributes.

—E.P.N.

Paperboard Production (Tons)*

	Mar. 14 1953	Mar. 7 1953	Mar. 15 1952
Production	242,903	251,323	205,407
New Orders	226,218	369,335	183,464
Unfilled Orders	517,597	544,346	409,399
% of Activity	94	96	85

* Source, National Paperboard Assn.

MARKET WOOD PULP

Second Quarter Contract Indications, Per Short Air-Dry Ton

	Delivered Basis		Varying Freight Allowances		
	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$85.00/ 87.50†	‡$60.00/ 90.00	$75.00/ 80.00§	$75.00/ — §	$75.00/ 80.00§
Sulfate, Bleached	140.00/147.50	145.00/155.00	137.50/142.50§		
Semi-bleached Sulfate	135.00/140.00		$127.50/130.00		
Sulfate, Unbl.	95.00/125.00	100.00/125.00	100.00/105.00*	105.00/135.00*	
Sulfite, Blchd.	140.00/ —	140.00/145.00	$130.00/135.00	140.00/ — *	140.00/145.00*
Sulfite, Unblchd.	125.00/ —		$110.00/ —	120.00/125.00*	
Sulfite, Unbl'd (glassine)	127.00/ —		$115.00/ —		
Soda, Blchd.	140.00/ —	140.00/ —			
Stand. News, Siderums	92.50/ —	80.00/ 85.00			

† Midwestern Markets. ‡ F.o.b. Shipping Point. § On Dock Atlantic Ports * Freight allowed.

WIN A PRIZE in the Second Annual Tenax Fishing Contest

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FOR

Paper, Pulp and Paperboard Mill Employees

ANYWHERE IN THE U.S.A.

Knowing how many of you get great pleasure out of fishing, Tenax Felts are giving you something extra to fish for . . . 46 worthwhile prizes. We sincerely hope you will be one of the lucky ones to win a prize this year.

These Prizes must be won!

NATIONAL GRAND PRIZE
10 H.P. JOHNSON OUTBOARD MOTOR

For the fish nearest the weight of all-time record fish of same variety, as listed in FIELD AND STREAM RECORD BOOK.

15—1ST PRIZES $100 SAVINGS BOND
(1 each variety of fish listed on official entry blank)

15—2ND PRIZES $50 SAVINGS BOND
(1 each variety of fish)

15—3RD PRIZES $25 SAVINGS BOND
(1 each variety of fish)

Get your entry blanks at your own mill now

See your bulletin board or ask your mill foreman for easy contest rules, official entry blanks and list of fish for which prizes will be awarded. Contest starts April 1—ends midnight, October 1, 1953. Get started early—because in this contest amateurs can win as easily as experts. First, second and third prizes will be awarded in *each* of 15 separate classes—for the heaviest of 15 different varieties of fish, from yellowtail to largemouth bass! In addition, you may win the National Grand Prize! *So . . . let's go fishin'!*

LOCKPORT FELT COMPANY • NEWFANE, N. Y.

WEEK OF PAPER TRADE JOURNAL MARCH 27, 1953

Full Production at Calcasieu In Spite of Strike

In spite of a still-unsettled strike at Calcasieu Paper Co., Elizabeth, La., the mill is maintaining production with a full complement of workers, according to the report of C. G. McGehee, Sr., chairman and president of the company.

The company has been officially under strike since September 1952. Bargaining has been complicated by divided allegiance among the workers, and the town of Elizabeth has been disturbed by a number of violent demonstrations during the last six months.

McGehee, also president of Jacksonville Paper Co., told *Paper Trade Journal's* Florida correspondent that during the last three months about half the old employes have returned to their jobs, and other workers have been found to fill the rest of the vacancies.

Hudson Repossesses Lansdowne Paper

The executive office of Hudson Pulp & Paper Corp. has confirmed the report that it has reassumed ownership of Lansdowne Paper Mill, Inc., Lansdowne, Pa. Prior to 1951, the mill was operated as the Mazer Paper Mill Div., Hudson Pulp & Paper Corp.

The lands, buildings and improvements, machinery, equipment, furniture and fixtures of the Lansdowne Co. were transferred to Hudson at a sheriff's sale January 23, 1953. The name of the purchaser was not revealed at the time of the sale.

Under the Lansdowne incorporation, the mill was operated by D. J. Schlanger, president and secretary; Joseph Yanklowitz, vice-president; Harold Yanklowitz, treasurer. Production on one cylinder machine and one Harper was centered on grades of toweling, toilet and twisting tissues, and bogus kraft.

Plan Pulp Chip Mill for Alaska

Pacific Northern Timber Co., which has won a fast tax amortization writ for a $4,502,570 lumber and pulp chip mill near Wrangell, Alaska, is being launched by Robert F. Johnson, president of the C. D. Johnson Lumber Co.; William Crooks, president of P. L. Crooks & Co., contractors; and Ralph E. Williams, Jr., financier, all of Portland, Ore.

The new firm hopes to start building its plant this summer, but may not do so until 1954, according to Mr. Johnson, who is president. The mill is expected to cut about 100,000 board feet of spruce and hemlock a day and chip about 75 tons of wood a day for pulp.

Financing of the project is well along, and a 99-year agreement with the United States Forest Service for timber is virtually assured, it was stated. The fast writeoff for tax purposes will apply to 40 percent of the stated cost.

John H. Vogel Economist APPA

J. H. Vogel

John H. Vogel, former OPS economist, has officially taken over the desk of Dr. Louis T. Stevenson who retired at the end of February.

For two years Assistant Branch Chief and Economist of the Pulp and Paper Branch, Forest Products Div., Office of Price Stabilization, Washington, D. C., and for eight years advisor to the U. S. Tariff Commission, Washington, D. C., on pulp and paper, Mr. Vogel got his practical industry experience at Nekoosa-Edwards Paper Co. Inc., Port Edwards, Wis. He majored in economics at Lawrence College, Appleton, Wis. and did graduate work in the same subject at American University, Washington, D. C.

After a southern vacation, Dr. Stevenson took up his duties with the investment house of Tucker, Anthony & Co., 120 Broadway, New York City.

Dr. Stevenson will be available for consultation by the APPA and other associations and companies in the pulp and paper industry.

Machinery of Pittston Paper Moved to Venezuela

S. J. Eisner, secretary, Pittston Paper Corp., Pittston, Pa., reported to *Paper Trade Journal* that all the machinery in the company mill has been sold to a newly formed Venezuelan paper company and is now being dismantled and transported to Caracass.

Sale of the equipment was made to the Caracass firm of Papeles Venezolanos, C. A., headed by Milton Hoff, an American in residence in Venezuela. The machinery will be installed in a new plant and operated for the production of toilet grades. It is thought that fiber for the operation will consist of European pulp and South American waste papers.

Among the machinery included in the deal are a 98″ Yankee Fourdrinier, a 65″ cylinder machine, three beaters, a Dilts Hydrafiner, and two jordans. The Pittston Paper Corp. continues to hold ownership of the plant buildings and is offering them for rent or sale.

Oxford Denies Cut-Back Rumors

Recent published rumors gave the impression that Oxford was cutting back operations.

According to a statement issued by one of Oxford's officers, under arrangements recently completed, a substantial portion of Oxford's standard conversion coated line will be manufactured by Martin Cantine Co., at Saugerties, N. Y.

The effect of this move will be to reduce operations in the Coating Division, at Rumford, Maine, to a small, compact unit manufacturing certain contract and specialty coated grades.

Oxford Paper Co. has developed new products and expanded operations in its paper and pulp mills at Rumford, Maine, including a substantial tonnage of machine coated papers, and is operating thirteen paper machines for the production of uncoated and machine coated papers.

Greco Buys Albia Mill

John D. Greco, head of the New York Fibre Corp., 233 Broadway, New York City, has purchased the Albia Box & Paper Co., Troy, N. Y. Auction of the mill property was held in Troy on March 18. Two bids were submitted, one of $91,500 in bulk for the entire mill, while Mr. Greco submitted an itemized bid totaling $109,000, which was confirmed on March 19 by the Court.

Mr. Greco purchased all of the real estate and the bigger part of the mill including all of the machinery and equipment with the exception of the paper machine. The mill will be completely revamped and a new paperboard machine will be installed.

Elk Falls Expansion

J. D. Zellerbach, president, Crown Zellerbach Corp., indicated in his Annual Report to the Stockholders that expansion of the Elk Falls Co. newsprint mill at Duncan Bay, B. C., is under development. Elk Falls Co. is jointly owned by Canadian Western Lumber Co. and Pacific Mills Ltd. (a wholly owned C. Z. Subsidiary). Crown Zellerbach therefore now controls one-half the Elk Falls shares and if present negotiations are concluded to take over Canadian Western, then Elk Falls Co, will become a wholly owned C. Z. subsidiary.

Valentine Gets C/N

The Valentine Pulp & Paper Co., New Orleans, La., whose intention to manufacture newsprint from sugar cane bagasse was announced in *Paper Trade Journal* several weeks ago, has received a certificate of necessity for accelerated tax amortization from the Office of Defense Mobilization. The certificate is for $2,633,200, with 45 percent allowed.

St. Helens Stockholders Debate C-Z Merger

Little or no opposition to the proposed merger of St. Helens Pulp & Paper Co. with Crown Zellerbach Corp. was voiced at the March 17 meeting of St. Helens stockholders. Heavy criticism of the move had been anticipated but did not materialize.

Led by St. Helens President Max R. Oberdorfer, the annual meeting proceeded through its formal business and then was thrown open for discussion of the merger. J. W. Fish, director and trustee, justified the merger on the score that the current expansion program of St. Helens was costing more than the estimated $6 million and that more funds were not available for borrowing, beyond the $4 million already negotiated. He stated further that both Marathon Corp. and Olin Industries, Inc. had estimated that $12 million expansion funds were needed to place St. Helens production "on a par with modern industry standards."

It was stated that final voting on the proposition will occur sometime between May 1 and 15.

C.C.C.C. Continues Work On Celgar Project

Development work being carried out by the Canadian Chemical and Cellulose Co., Ltd. (Celanese Corp. of America subsidiary) in its Celgar development on the British Columbia Arrow Lakes in 1953 includes preliminary testing at the plant site near Castlegar and continuation of work on a forest inventory associated with the forest management license of the company, according to M. W. Mackenzie, executive vice-president of Canadian Chemical and Cellulose Co., Ltd., of which the Celgar Development Co. is one unit.

Mr. Mackenzie said that all of 1953 would be required to gather the data necessary for the development of a working plan which must be produced prior to the signing of a management license contract with the government.

Improvements at Grays Harbor

A program to improve the paper making equipment at the Grays Harbor Division of Rayonier Incorporated will permit manufacturing of better qualities of paper at the mill and will broaden the line of paper products that can be made, giving the operation a better competitive position.

Work began March 23 to prepare the paper machine for installation of additional equipment later this year. The paper mill will be out of production for approximately two weeks while this first stage of the work is carried out.

Operation of the pulp mill will not be affected.

Whittemore Denies Brown Co. Sale

In a telephone interview with Lawrence F. Whittemore, chairman of the board and president of Brown Co., Berlin, N. H., *Paper Trade Journal* correspondent learned that although Brown Co. know that a story regarding offers to buy had appeared in newspapers, the company had never received these offers.

Mr. Whittemore was quoted saying: "No offer has been made and no talk of offer. The company is not seeking to sell."

"Forced" Dependence on "Foreign" Source, Bosh!

In an address at Town Hall, New York City, on March 24, R. M. Fowler, president of the Canadian Pulp and Paper Assn., expressed concern over recent protests by some United States politicians and publishers against United States "dependence" on Canada as a source of newsprint.

"Perhaps this recent attitude among some of your politicians toward newsprint is a dying issue and the mere residue of an old form of economic isolationism, but we in Canada are concerned about it," he told a forum audience of about 450. The forum was the fourth in a series on "Canada — Nation on the March."

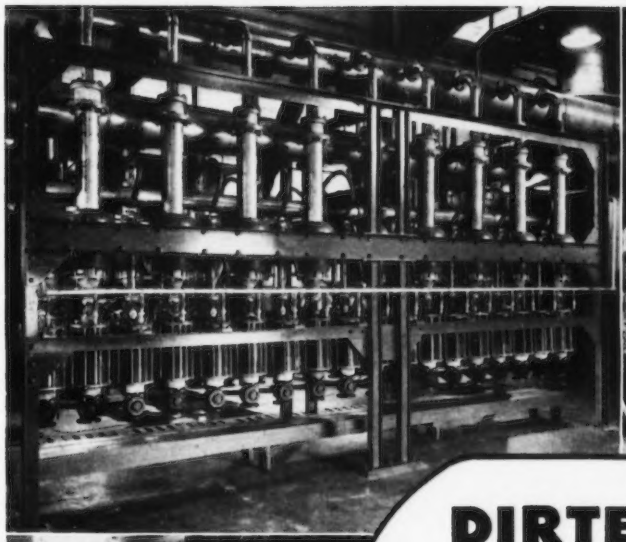
"It seems to us that newsprint is only an example of a more general discomfort in this country over your growing need to depend on 'foreign' supplies of materials you require. If this attitude is widespread or should grow, it has some undesirable political implications. No one likes to be regarded as a 'foreigner' for this is a word that seems inappropriate for neighbors and allies.

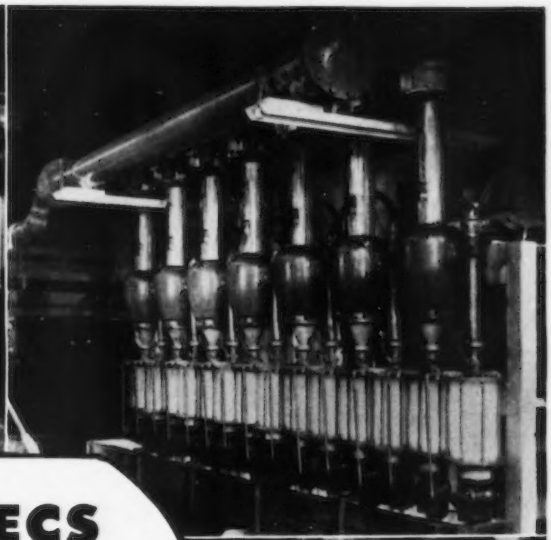
"It also has bad economic implications; it runs counter to your basic belief in the virtues of competition. Moreover, it ignores the point that to export you must import and newsprint is our largest export commodity to the United States.

"If you become self-sufficient in newsprint, Canada would cease to be the largest single market in the world for your exports."

Mr. Fowler said that today and for many years the United States has obtained from Canada 75 to 80 percent of its newsprint requirements, and that Canada has "proved itself to be a reliable source of supply for your expanding needs."

Last week in Washington, the House Interstate Commerce Committee received an allowance of $60,000 for a study of alternate sources of newsprint. The group's chairman, Representative Charles A. Wolverton, Republican of New Jersey, had contended that United States publishers are "absolutely at the mercy" of Canadian newsprint prices.





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have demonstrated beyond all doubt their ability to get the dirt out of *your* kind of paper stock, and do it with insignificant loss of good fibres at low cost per ton and per year.

Before you invest in any equipment to make a cleaner sheet be sure you get the whole story on Dirtecs and what they can do.

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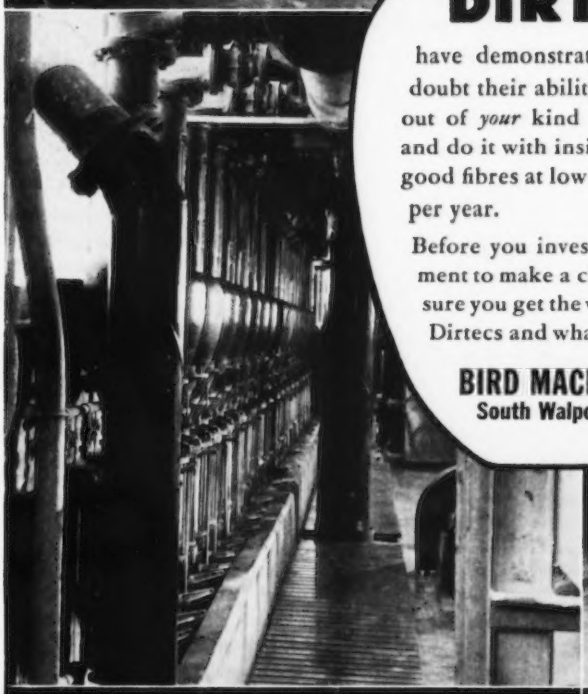
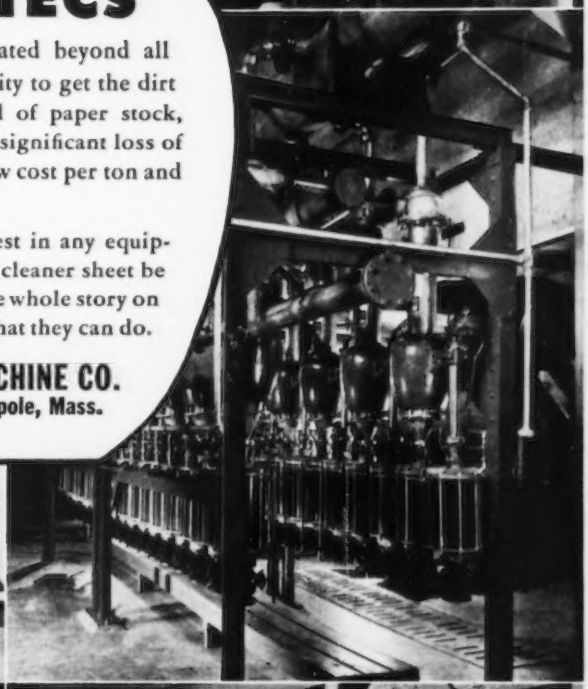
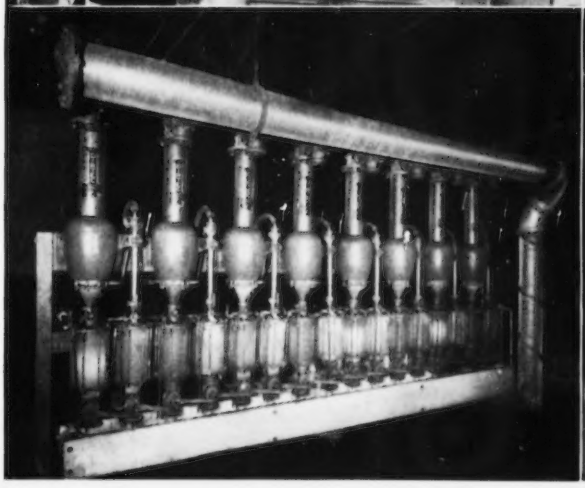
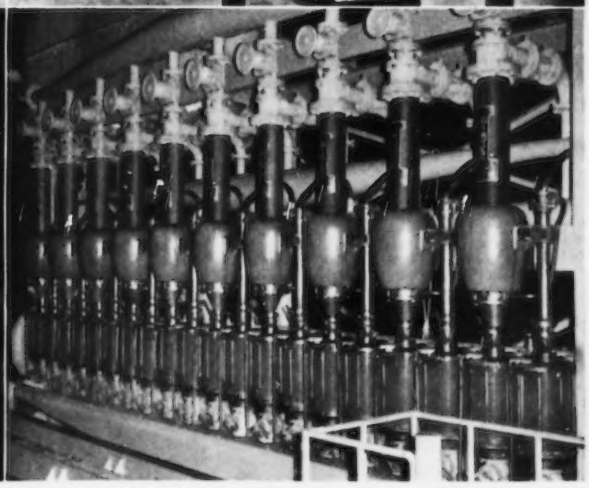








Waste Paper Utilization Problems*

Henry J. Perry

Director-Secretary, Waste Paper Utilization Council

If the reports circulating in the trade press are correct, one would assume that we are assembled at this meeting for the purpose of holding a wake. I, for one, refuse to take part in any such proceeding. What we are actually here for is to prevent such an occurrence. The process may be painful!

The time has come to quit groaning and moaning about the state of the paperstock industry, and to look at the cold, hard facts of our common ailments. We have lots of them. Some more serious than others, many exceedingly difficult to solve, and probably some which we will be unable to correct.

Let's turn on the light and see where we all stand. The first thing we see and hear about is that there is too much paperstock available. Prices are too low and competition is too keen. These facts are probably all too true, but is there anyone in this room who thought that prices following the start of the Korean War were going to continue forever? Is there anyone here who thought that that period's frenzied demands were going to continue indefinitely? I cannot believe that any of you have had such thoughts.

This whole industry has had a history of ups and downs, wilder than any commodity I know of, with the exception of some land booms. Whether we like it or not, whether we want it that way or not, so long as we remain free to do business under our preferred capitalistic system, we are going to have wide variations in supply, demand and in prices. I am sure that some of you would seriously miss the fun of taking a chance if we were completely regimented. There appears little that we can do about these cycles.

Basic Weakness—Quality

Next, let us consider a whole world of problems facing us, with which we can work and do something to correct. I suspect that quality is our basic weakness. Quality not only spelled with a capital "Q," but in all capitals and flashing neon lights. We have had the supply and demand headache many times before but never, to my knowledge, have we had such a big dose of poor quality. It can get worse. In fact, it is in the cards to get worse if we do not do something about it now.

The doing something about it is the job of the Waste Paper Utilization Council. We realize that it is late and that there are so many problems that maybe the hardest one is choosing where to start.

The first barrier to hurdle is determining what materials are causing trouble. It could be assumed that everyone in our industry should know what the troublemakers are, but every mill is a different problem caused by the different grades it manufactures, the different packings and grades it uses, the different paperstock systems installed. If there are two systems alike, I have yet to see them. And, so it goes. We are in the midst of a horribly confused mixture of troubles.

"What can be done most quickly?" is a logical question to ask.

In my travels, visiting our various members, there are several common complaints. A review of these is very much in order. I should like to cite some examples.

Better Sorting Needed

In one mill using a large tonnage of soft white shavings we found in more bales than not, anywhere from ten to one hundred pounds of printed waste. This stock is the main component of a top liner for a high quality patent coated boxboard. With competition today, the box maker, the paperboard mills' customer, is becoming increasingly demanding of a better printing surface, higher brightness and whiteness, and any print which gets into the top liner destroys these desired qualities.

Rejections and maybe loss of the customer can and does result from poor quality paperboard. This mill, therefore, is required to employ 18 men per day at $80 per week to open up and inspect every bale of waste used. Strangely enough, this printed stock does not show up on the outside of the bale. Somehow, it is most inconveniently found on the inside. It is there by no accident.

Another mill making the same product ran some cost studies recently. The result showed them that if they gave up white shavings and went to all bleached pulp at $140 per ton, it would same them $1.50 per ton of finished board. This saving, of nearly $1,800 a week, is well worth looking into from their point of view. Added to this is the cost of rejection, the arguments that are generally provoked, and the chance of losing a valuable customer.

And, so it goes. Some mills have received such poor packings of ledger that they will no longer take in the grade. One member told me only last week of finding a dead dog in a bale of supposedly sorted ledger.

On the other hand, we find many of our members, who, working in close cooperation with their paperstock suppliers, have little difficulty. They report that they have cut down the number of dealers with whom they do business. The dealers of their choice, they feel, are as much a part of their organization as the woodpulp suppliers and their own woodlands departments. They realize that good paperstock costs money, and are willing to pay for the extra value received.

*Presented at the Waste Paper Institute meeting, 40th Annual Convention, National Association of Waste Material Dealers, Inc., March 17, 1953.

While this Council is not concerned with mixed papers, some of our members do use it. Some of them did and have discontinued and many of them want to. One member told me that he is paying $10 a ton for his mixed paper. He estimates that the fiber content costs him $20 per ton, the balance of the bale is pretty expensive land fill. He says he would gladly pay $20 a ton for a clean pack of mixed paper.

The Crux—Dealers Suppliers

We could go on for hours on such cases which you and I all know about. There is nothing that the Waste Paper Utilization Council can do to correct these conditions at the present time, but you can as paperstock dealers. It is up to you to work back to your sources of supply of the high grades and see to it that they give you a product that can be used. Call it "Merchandising In Reverse," if you will. It seems a must of elemental importance.

Thus, one of the first problems we are faced with is the reliability of quality which you alone can solve to your own profit. On the other hand, you may rest assured that if you do not, someone else will sell your supplier the idea that good quality of uniformly packed paper stock pays. Or possibly, some one will devise a superior stock cleaning system which will take low grades and turn them into clean white high grade pulp, ready for fine papers.

Asphalt Contamination

The next group of problems with which we are faced and upon which we can all work together are those which might be called the common sense problems. One of the most serious of these is asphalt or tar. Nearly everyone at some time has had a dose of tar traced directly to high grade shavings or cuttings. The basic reason for this is that many paper mill customers require a water-proof wrapping. A secondary source is the asphalt stay on corrugated boxes. Some people call them tar strips.

In the baling of waste paper the baler is always anxious to use the most convenient material for the tar of the bale. Thus, we find water-proof wrappers or old corrugated boxes a most common material and there hangs the main source of asphalt contamination. Many of the consuming mills have reached the point in desperation where they will refuse to accept any bale with corrugating containing tar strips or water-proof wrapping.

Here is the job of education by you among your suppliers. One small piece, the size of the palm of your hand, can ruin many tons of paperstock. Tar strips and water-proof wrapping should be easy to identify and kept out of the reuse channels.

Your efforts to stop this one irritating and costly practice will avoid rejection and loss to your suppliers, to you and to the mills.

We, in turn, are asking our consuming members and all other mills for that matter, to see that their wrappers are properly marked with the phrase, "Burn this wrapper — it cannot be reused," or words to that effect.

Another problem which is beginning to cause trouble is the use of roll header cements of rubbery nature. Several printers are refusing shipments of paper using this type of material, and the purchasing agents have been asked to work with their suppliers in overcoming this difficulty.

Flying Pasters and Splices

Still another problem is that of the so-called flying pasters and roll splicing compounds. To date no one has found a satisfactory flying paster cement which can be reworked without difficulty. Considerable work in the laboratories is, and has been done, but it may be some time before the problem is solved. However, we are faced, at present, with solving this problem. One way is for the press room or converting company employes to carefully sort out each paster and keep an accurate tally and check that they are eliminated.

Printers Waste

You can then go into many other problems of the same type, from dumping of ink fountains onto a slab of paper, folding it up, and putting it into a bale of waste. Paper wipers, over-inked proof sheets, and trash are all too common in the printer's waste. Some of our members report that they will no longer accept any crumpled printers' waste because of the danger of hidden trouble. If these inclusions continue, printers' waste will no longer be an acceptable grade for the de-inking mills and they will deteriorate to a level no better than old news. The result will be a considerable loss in revenue to your supplier and to you. Is the printer interested in keeping out these materials? We think he should be, for many printers depend upon their paperstock sales as their source of profit.

"JOE BEAVER" By Ed Nofziger

Forest Service, U. S. Department of Agriculture

"Sh, quiet! Your mother is out on a conservation job—planting trees with some club women."

The Unknowns

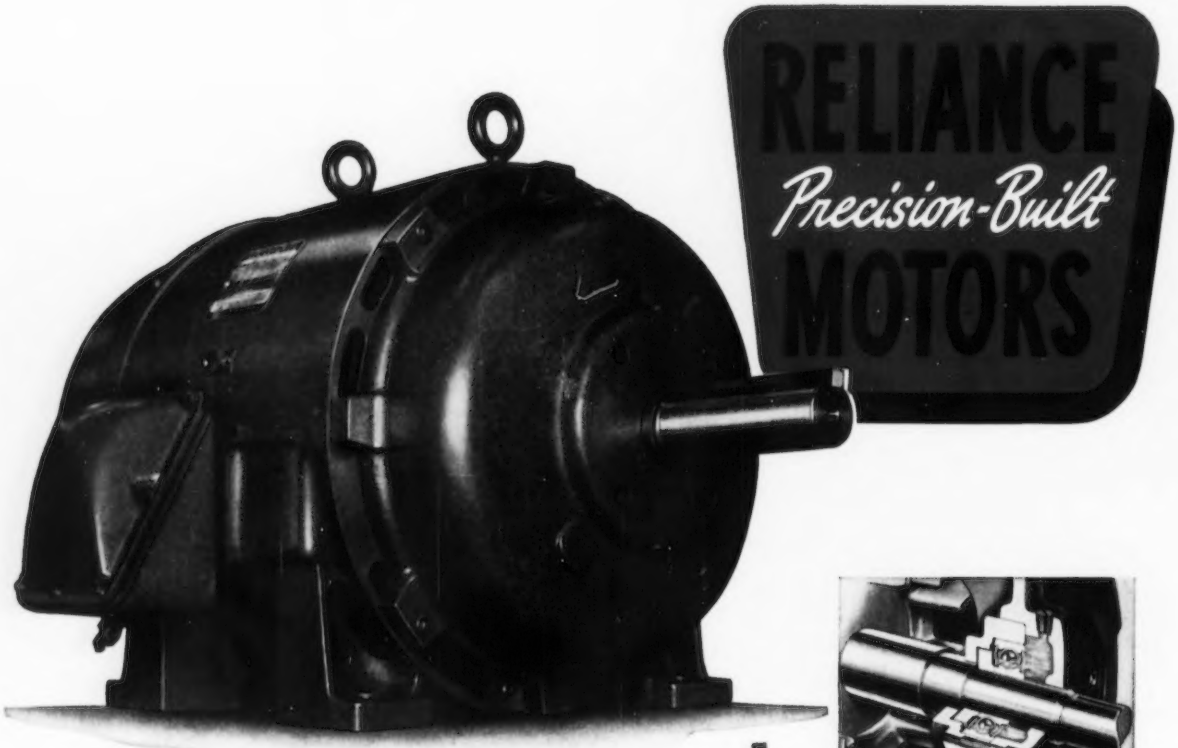
Next, we come to our most difficult problem. Those of the unknowns. Heat-set inks, hot melted adhesives and coatings, plastics of all types and descriptions, heat-sealed labels and wrappers, wet strength and various impregnated paperstocks of all kinds. Our current program calls for the answers to these questions: Who makes them? Where are they used? How can they be identified? Not in the laboratory, but by you and your men and by the mill people as well. Can they be modified so that they may be reused? How and where can we devise methods to reuse them?

One positive attack is where such an item is found to be causing trouble is to ask the manufacturer of the product to tell his customer that the scrap is valueless. To help educate his people that the scrap cannot be reused and must be burned, for if it gets into reusable paperstock it destroys the value of all. We have reports that some mills are so marking their cases and I am sure it will increase. We believe this is a good customer service for our paper manufacturers and convertors to give. They must be just as concerned with the profits of the customers as they are their own. You may be interested to know several paper jobbers are showing interest in this phase of our work.

These are a few of the facts. The Waste Paper Utilization Council is organized and operated by a membership composed of paper and paperboard mills, paperstock dealers, printers, manufacturers of all types of inks, plastics, adhesives and other materials, banded together to stop this stupendous loss of valuable fiber so that all may profit thereby.

I did not come to a wake. I came to a christening where everyone concerned wants to put this industry in a sound, healthy condition, a place which it richly deserves.

DEPENDABLE...because they're ENGINEERED FOR RUGGED SERVICE



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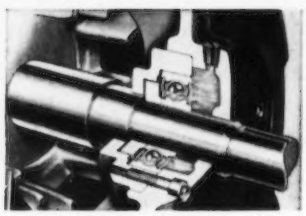
B-1402



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J. E. Todd

of I.P.C. discussed this interesting topic at the March meeting of Ohio TAPPI

Selection of Technical Personnel

The March meeting of Ohio TAPPI attracted 101 members and guests to an instructive and serious evening at the Hotel Manchester in Middletown, Ohio.

Dr. J. Edward Todd, of the Institute of Paper Chemistry, Appleton, Wis., spoke on "The Selection of Technical Personnel." He opened his talk by quoting the March 10, 1953, issue of "Ohio Tappi" as follows: "Competition, greater production, higher speeds, and customer demands are but a few of the many factors tending to place more emphasis on the need for technical personnel in the paper mill. With this growing accent on technology, the proper evaluation of the potential of applicants for technical employment has become an increasingly acute problem. This problem is felt more by the smaller mills, however, than by the larger since they have not had the means nor capacity to employ personnel trained for this hiring job."

Signing up new personnel is more difficult than it sounds and it is customary for the employer to expect more than he gets, human nature being infinitely complex and unpredictably dynamic.

Since 1949 the industries which have grown most rapidly in their order of growth are natural gas, aluminum, paper and the chemical mineral groups. The paper industry has doubled since 1949 and now is making annual sales of eight billion dollars from plants valued at six billion dollars.

The rapid growth which has been experienced is largely due to the impact of scientific knowledge in solving the problems of the industry accompanied by a wide national prosperity.

Management has, therefore, come to a realization of the importance of supplying their organizations with trained technical manpower and the business of recruiting them from the ranks of college graduates has become a very serious and highly competitive enterprise. This hunt for superior technical manpower has become more intense because where there were 45,000 to 50,000 engineering graduates 2 to 3 years ago there will only be 20,000 available this year to fill an estimated 50,000 to 75,000 openings, so that only a third of the men needed will be employed. One organization has recently recruited 90 men from European universities but only time can tell whether this will be a good solution of the problem. There now seems to be an uptrend in registrations for college freshmen in engineering and technical courses for next fall but it will take four years before industry can hope to use these men. There is also increased interest among graduates in specialized training as evidenced by the fact that the next first year class at the Institute of Paper Chemistry will be double the size of this year's class.

What does industry look for in the men they are recruiting? George Bennett, president of Psychological Corp., says, "Some of the qualities considered essential to research personnel (and technical personnel) which might distinguish them from salesmen, administrators, production supervisors, and others in industrial activities are shown in the accompanying box.

Dr. Todd then posed the questions: Are these qualities essential? Are they distinguishable, measurable, related to competence and critical? He feels that there is considerable evidence to prove that they are critical, especially in combination when selecting a good technical or research man.

He felt that George Bennett's idea that superior research personnel can only be selected by a combination of the following was worthy of commendation: A complete analysis should consist of an evaluation of the candidate's achievements at school and at work, an appropriately planned and conducted interview and finally if possible he should be given a properly selected battery of test.

The evaluation of school work and experience call for consideration of a transcript of the candidate's grades, records of honors and school activities, his ratings in any performance reports the school has available, the letters of recommendations from his teachers or former employers and a close study of the way he has answered the questions on the application for employment.

1. Knowledge of the scientific field.
2. Superior intelligence.
3. Ability to write reports and speak well.
4. Ability to produce new ideas — imagination.
5. Persistence in the face of difficulty.
6. Curiosity and a desire to solve problems.
7. Possession of certain character traits including honesty, generosity, self discipline, courage and tolerance.
8. Attitude toward work.
9. Ability to analyze and develop an organized attack on the problem, rather than dependence upon an inspired attack.
10. Competence in recording and interpretation of data.

Employment forms are now available through certain organizations that put the questions to the applicant in such a manner that much information can be obtained about his character and personality by the way he frames his answers. Dr. Worthington, a clinical psychologist, has designed a data sheet which the applicant fills in without realizing it is an application sheet. The psychologist then analyzes the answers and gives the employer his analysis of the character of the applicant.

Dr. Worthington points out there is no substitute for the personal interview of the candidate alone and also in a group situation. The group members may include board members who make the final decision on employment of new personnel and possibly a psychologist. In groups certain situations may be created to obtain the candidate's reactions.

As an additional check on the qualifications of the candidate a battery of selected tests may be used and the candidates rating can be compared with the ratings of personnel already employed in the type of work he is being hired for to see if his rating follow the group pattern.

Dr. Todd demonstrated the results of some of groups tested by showing slides. He further classified the tests into such other groupings as knowledge tests, intelligence tests, productive thinking tests, character tests, questionnaires and projective test.

The tests of knowledge are often standard tests given in chemistry, physics and other subjects in the college and the candidate may know his score or the college may furnish it on request to a prospective employer. Intelligence tests include college aptitude and selective service tests. Psychological Corp. has a productive thinking test the results of which can be compared with known levels of performance for a known group. There are now available some 500 different tests which are used to determine the character of the applicant.

The questionnaire answers are usually compared with known behavior of persons previously tested.

Projective tests are usually conducted with ink blots or pictures. The candidate is shown the various blots or pictures and asked what they suggest to him. An experienced tester can get a great deal from such personal reactions.

Personality tests are used mostly for personnel required to do confidential or spy work. They are told to assume a certain character or conceal certain information from their group. Other members of the group also are charged with the same responsibility. They then try to find the other person's secret or real identity. They are even served drinks to see if they will break "cover" under the influence of alcohol.

Because of the wide choice of jobs for each available graduate the colleges are now developing placement advisors to help these men pick the jobs for which they have the best qualifications if the graduates ask their help.

There is a 13 to 40 percent increase in freshmen enrolled in engineering and technical courses this year over last year among the various colleges offering this type of training.

Summarizing his talk, Dr. Todd brought out that many factors have developed the need for technical personnel with certain essential qualifications. Tools and methods of making the proper selection for the specific jobs in the paper industry are within the reach of all employers and are now being widely used. Untrained persons should go slow, however, on interviews and tests and should not hesitate to get professional help from colleges and universities or trained consultants in the employment field in selecting personnel for technical jobs.

In the discussion which developed after this excellent presentation by Dr. Todd several very interesting ideas were explored. It was felt that the paper industry should attempt to develop an attractive brochure to justly represent the third largest industry in the nation. The oil companies and electrical manufacturers and the chemical and steel industries have developed such brochures and implemented them on the college campuses by sending men highly placed in their organizations to follow up on these brochures and make their industries as attractive as possible to the graduates. A student advisor recently approached on the campus of one of our state universities said, "What is this paper industry? I've never heard of it before."

There does seem to be a field for some constructive publicity for the paper industry if we are to get our share of technical personnel from the colleges in competition with other industries.

A suggestion was also made that an aptitude test be prepared to check a candidate's interests which might lead him to an interesting career in the paper industry. A liking for mathematics and a sensory test indicating a highly developed sense of smell were humorously suggested as possible aptitudes indicating an interest in our industry.

D. Jenkins, program committeeman in charge of this meeting, and Chairman E. Brandon expressed the appreciation of Ohio TAPPI to Dr. Todd for his fine presentation of a timely and vital subject and the warm and friendly manner in which it was presented.

Pyrites Roasting in Nichols-Freeman Roaster

Lennart Brown

An Abstract

The Nichols-Freeman pyrites flash roaster at Nokia has been operating for almost ten years. The following results have been obtained from the process: Only such pyrites are suitable which practically taken completely pass through a screen with 0.12 mm mesh size. In addition, the moisture content of the pyrites must be less than 0.5 percent. The higher the temperature in the combustion chamber, the less are the sulphur losses as unburned sulphur and SO_3. The load of the roaster may vary from 100 percent down to 25 percent, but in the latter case, care must be taken that the temperature of the gas does not fall below 300°C. prior to the cooling tower. By maintaining a high temperature in the combustion chamber and using washed gases in the recirculation, the sulphur losses have decreased considerably and they are now about 4 percent of the sulphur input. Under favorable conditions, when pyrites free of zinc are roasted, the losses can be reduced to ca. 3 percent. Depending on the temperature of the water fed into the boiler, from 3.1 to 3.6 kg. of saturated steam can be generated per kg. of pyrites roasted.

The power consumption of the Nichols-Freeman roaster proper has been about 25 kwh. per ton of pyrites roasted. To this must still be added 13 kwh. for the electrical precipitators, tower gas fans, etc. The predryer of pyrites consumes about 1.35 kwh. per every kg. of water evaporated, but the heating of the pyrites to 50°C. is also included in this figure.

The labor requirement for the roaster is one man per shift. The maintenance costs are moderately low consisting principally of the cleaning of the boiler, packing of stuffing boxes and changing of the burner nozzle and pyrites feeder screw. — *No. 2, 1953 Paperi ja Puu.*

A Review of the Literature on

Second of Two Parts
First Part Appeared
Last Week

The Oxidation of Sulphate Black Liquor

T. T. Collins, Jr.
Appleton, Wis.

As an interesting side light on some of the possible ramifications of the oxidation of black liquor, Raff, Tomlinson, Davies, and Watson *(37)* have reported that oxidized lignin or lignin made from oxidized black liquor is superior to ordinary sulphate lignin for rubber compounding. A further discussion of this phase of the subject has been given by Raff and Tomlinson *(38)* and patented by them *(38A)*.

INKA Evaporating System

In addition to the Bergstroem-Trobeck and Tomlinson systems for oxidizing black liquor, it has also been recognized in recent years that oxidation occurs in the INKA system used for evaporating sulphate liquor. The history and literature referring to this process, developed more than twenty years ago, has been reviewed by Collins and Collins *(39)*. Essentially, in the INKA evaporator the black liquor is heated indirectly by condensing stack gases from the recovery furnace, and the hot liquor then flows over a perforated plate through which dry air is blown. The air is heated and saturated by evaporating moisture from the black liquor, which by repeated heating and aeration is concentrated to an appreciable extent. Brauns *(40)* and others *(41, 42)* have described the INKA evaporator at the Grycksbo Pappersbruk, and Brauns has mentioned that blowing air through the liquor results in oxidation of some of the sulphur compounds. Actually, many of the INKA patents concern the design of an aerating and evaporating device which will bring the liquor in contact with air without causing excessive foam. Mr. Naucler of INKA has stated *(43)* that in the INKA evaporator the concentrated liquor volume circulated through the unit is approximately twenty times the weak black liquor to be evaporated and that 80 percent of the sulphide is oxidized. Trobeck *(44)* has stated that partial oxidation takes place in the INKA evaporator. It is to be noted that this reaeration of the liquor approximately twenty times is a considerable treatment for the degree of oxidation obtained and reported. This report of moderate oxidation efficiency is no doubt due primarily to the analytical method used, but there is the possibility that since concentrated liquor is circulated in the INKA evaporator, as has been pointed out by others, concentrating the liquor makes its oxidation more difficult.

In his discussion of the INKA system, Schotte *(45)* mentions that the air-vapor mixture from the prethickening operation, together with fresh air, can be used as the combustion air for burning waste liquor. Undoubtedly, this would result in the combustion of organic sulphur gases leaving the INKA tower.

The work of Bergstroem and Trobeck, as well as that of Tomlinson's group, has been reviewed partly by Murto *(46)*, and Dexter *(47)* has mentioned oxidation.

Bialkowsky and Dehaas Studies

A considerable study of oxidation has been carried out by Bialkowsky and Dehaas *(48)* of the Weyerhaeuser Timber Co. They point to a very definite decrease in the sodium sulphide content due to oxidation when handled over black liquor washers. From their work with polarographic analysis, the authors indicate that organic compounds in black liquor catalyze the oxidation reaction by absorbing or reacting with the oxygen, which then in turn oxidizes the sulphide. In addition, more oxygen will react with black liquor than that necessary for oxidation of the sulphide only. Moreover, sulphide added to completely oxidized black liquor can in turn be oxidized, and this demonstrates the continued catalytic action of the organic constituents.

Determining sulphide concentration using the Borlew-Pascoe method and using black liquors resulting from the pulping of Douglas-fir and containing 3.3 to 5.9 grams of sulphide (as Na_2O) per liter, several laboratory oxidation towers were investigated. Investigations of towers packed with Raschig rings were carried out, with foam resulting in some tests and not in others. In another set-up, air bubbled through liquor in cyclinders developed less foam as the temperature was increased and this also resulted in increased oxygen absorption. Addition of air to the pilot plant digester at the end of the cook resulted in oxidation of sulphide but was time consuming and increased the bleachability of the pulp.

The basic oxidation studies were carried out in a glass oxidation tower using "wetted wall" surfaces with careful control of the temperature, humidity, and flow rate of the air, control of the liquor flow and temperature, and liquor storage under nitrogen to eliminate oxidation outside the experimental zone of the system. Complete elimination of the sulphide ion in the black liquor resulted at 50-60 grams of sulphide (as Na_2O) per hour per square meter of surface area at normal operating temperature with an air rate of over 2400 cubic feet per hour per square meter a reasonable value. Based on their laboratory data they predicted that 1000 square feet of packing surface (wetted) will handle 10 pounds of sulphide ion per hour. At 3 grams of sulphide per liter, the flow

should be 400 gallons per hour per 1000 square feet with a gas flow of 10,000 cubic feet per hour.

In order to predict the sulphur retention in liquor passing through the cascade evaporators resulting from oxidation, a laboratory "cascade" test was devised in which hot nitrogen gas, containing carbon dioxide, was passed through black liquor to concentrate it and evaporate it to dryness. The effluent gases were passed through sodium hydroxide solution for absorption of the hydrogen sulphide which was determined potentiometrically by titration with silver nitrate using the Borlew-Pascoe method. Unoxidized liquor lost all of its hydrogen sulphide content during the evaporation period, whereas completely oxidized liquor lost only about 22 percent of the sulphide and that only during the final evaporation to dryness. Thus it was concluded that oxidation will eliminate sulphur loss in the cascade evaporator but not when the liquor is subjected to elevated temperatures in the furnace.

In studying the possibility for oxidizing non-condensible gases from digester relief and blow in the presence of black liquor; hydrogen sulphide, methyl mercaptan, or dimethyl sulphide were passed into the laboratory oxidation tower with the air. Hydrogen sulphide was completely absorbed and oxidized; five percent of the methyl mercaptan passed unchanged, and forty percent left the tower as dimethyl disulphide indicating the rest had been oxidized to dimethyl disulphide and absorbed in the black liquor from which it would presumably later be stripped on evaporation. Over ninety percent of the dimethyl sulphide passed through the tower unchanged. This data should be compared with the findings of Wright *(50, 51)*.

Pilot plant investigations of a tower packed with three inch partition rings showed good correlation with the laboratory data for a liquor flow corresponding to 42 grams of sodium sulphide per hour per square meter. Oxidation efficiencies of a maximum of 100 percent were achieved on liquor containing 3.9 grams of sodium sulphide per liter.

A mill scale tower was designed for oxidizing 300 g.p.m. of black liquor containing 3.0 grams of sodium sulphide per liter. A tower 10 feet in diameter by 30 feet high was packed with 22 feet of 4 inch cross partition rings to give an effective area of 50,000 square feet. Air and liquor were passed into the top of the unit concurrently to avoid foaming, and approximately 10 cubic feet of air were used for each gallon of liquor. Results of operation of this tower after the system was brought to equilibrium (the tower was not handling all the liquor since a small amount was by-passed) were 90 to 100 percent oxidation of 2.1 to 3.0 grams of sodium sulphide per liter, the elimination of 3000 pounds per day of sulphur make up for 170 tons of pulp daily production, and a raise in sulphidity from 16 to 20 percent. No foaming difficulties were reported. Analyses of the recovery furnace flue gases for hydrogen sulphide before and after the cascade evaporators showed 0.5 and 1.0 mg./liter respectively before oxidation and 0.390 and 0.389 mg./liter respectively after oxidation brought the system in balance. The laboratory demonstration that oxidation eliminates the sulphur loss from the cascade evaporator was thus verified. Thus 18 pounds of sulphur per ton of pulp were saved, air pollution was decreased by a corresponding amount, and a higher equilibrium sulphidity of white liquor was achieved by oxidation.

A recent publication *(49)* of operating data for the oxidation tower at the Springfield, Oregon, mill of the Weyerhaeuser Timber Co. reports complete oxidation of the liquor if the load does not exceed 0.67 pounds of sulphide ion (as S) per 10,000 square feet of packing surface per minute with an air flow of 4 to 6 cubic feet per gallon of liquor for normal concentrations of sulphide. At 100 pounds of salt cake per ton of pulp makeup, the oxidation system maintains the white liquor sulphidity at 21-25 percent.

Wright's Research

Wright *(50)* has pointed out that the term black liquor oxidation has been called *stabilization* in some cases and should more properly be called *black liquor fixation*. His research is a project initiated in 1948, carried out by the British Columbia Research Council, to study the odor problem for five Canadian sulphate mills. A method of analysis *(52)* for hydrogen sulphide and methyl mercaptan was developed, and the kinetics of the oxidation process were studied. They determined that oxidation of the sulphur compounds requires a certain time of exposure regardless of the area of the air-liquor interface and that nothing is to be gained by increasing the superficial area of the liquor beyond a certain point. To test the laboratory data, a pilot plant oxidation unit was erected at the Port Alberni, B. C. mill of Bloedel, Stewart, and Welch. Concurrent flow of air and liquor was used in the oxidation tower to avoid foam and to reabsorb, in oxidized liquor, sulphur compounds liberated in the early phases of the oxidation. In order to test the absorption and oxidation of digester relief gases in the oxidation tower, non-condensible digester gases were added to the air supply to give concentrations as high as 15 mg. of methyl mercaptan per liter. These gases were practically completely absorbed, and the exit air carried little, if any, kraft odor. This claim should be compared with the data of Bailkowsky and Dehaas *(48)* which indicates somewhat different results.

In a study published on the kinetics of black liquor oxidation, Wright *(51)* pointed out that the first step in oxidation is diffusion of oxygen through the air-liquid interface, and the second effect is the chemical reaction of the oxygen with the sulphide in the liquor. He suggests that the necessity for increasing the interface area beyond a certain point, such as by the creation of foam, is doubtful since the chemical reaction resistance is the main controlling factor. This work covered an investigation of the rate of absorption of oxygen in black liquor under steady state conditions of temperature (40-90° C.), pressure (atmospheric), and humidity. The interfacial diffusion factor was eliminated or minimized by the techniques employed. The study was based on black liquor from the pulping of Douglas-fir and western hemlock containing 1.7 grams of Na_2S per liter and in some cases added hydrogen sulphide and/or methyl mercaptan. The results indicate that the oxidation of the sodium sulphide in the black liquor is a first order reaction taking place during the first part (requiring two or three minutes for completion) of the process and is followed by slower reactions which continue indefinitely. It was observed that sodium sulphide and methyl mercaptan are oxidized more rapidly in black liquor than in sodium hydroxide solution, probably due to catalytic substances in the wood. It was also found that storing black liquor samples in filled, closed containers or under nitrogen prevents a change in the sulphide content during storage.

The patent issued to Kress *(53)* describes an oxidation tower for sulphate black liquor consisting of a continuous succession of oppositely inclined shelves from the top of the tower to the bottom. Air is passed countercurrent from the bottom of the tower to liquor flowing in at the top.

Work of Collins

Collins *(4[1], 5[2], 54)* has published a series of papers covering a study of methods of analysis for the sodium sulphide content of black liquor, particu-

[1] Paper Trade J. 130, no. 3: 37-40 (January 19, 1950).
[2] Paper Trade J. 131, no. 15: 30, 32-34, 36, 38 (October 12, 1950).

larly if oxidized; sulphur losses from heating black liquor or various sulphur compounds contained therein; and the effect of operation of a full-scale black liquor oxidation system on the sulphur balance of the kraft mill and sulphur losses from the vacuum and disk evaporators, recovery furnace, and Venturi-Scrubber operating on the stack gases.

Collins *(54)* made a comparison of various analytical methods and modifications; such, as the TAPPI, Bergstroem-Trobeck, Moltzau, and Borlew-Pascoe procedures for the determination of sodium sulphide in and the degree of oxidation of black liquor. It was shown that possible and serious errors result with the use of any of these methods and that certain factors must be considered when any of the methods are used, particularly when dealing with black liquor of a high degree of oxidation. The necessity for preventing contact of the black liquor samples with the air during storage and analysis was also recognized. Although the Borlew-Pascoe method was found to be the most suitable method, the reader should refer to the original paper for a discussion of all the factors involved.

In a study showing the ratio of sulphur to sodium at various points in the kraft process, Collins *(4)* has also indicated the changes in sulphur compounds in black liquor which occur as a result of oxidation. The data shows that oxidation of black liquor does not materially reduce the amount of sulphur which will be driven off by heating at elevated temperatures, and tests with pure compounds show that both the sulphide and thiosulphate decompose at relatively low temperatures. Mere conversion of the sulphide to thiosulphate by oxidation does not prevent the sulphur loss at recovery furnace temperatures, although the ratio of loss as hydrogen sulphide to sulphur dioxide from the combustion of black liquor is undoubtedly influenced and probably decreased by the oxidation of the liquor. Chemical oxidation of black liquor with peroxides was shown to be impractical.

Carrying a pilot plant investigation of oxidation to full-scale application in the Thilmany mill, Collins *(5)* has developed equipment that converts all the black liquor to foam and back to liquor ahead of the vacuum evaporators or in conjunction with a brown stock washing system. Some difficulties with foam-breaking were experienced on green wood but it is anticipated that mechanical foam breakers can handle that problem. With the normal sulphidity of the Thilmany mill at 20-22 percent TAPPI, the addition of liquid niter cake as partial make-up resulted in a sulphidity of 24-26 percent. Oxidation alone raised the sulphidity level to the same range of 24-26 percent, and the niter cake and oxidation together increased the sulphidity to 30-33 percent. Requiring power of 2.5 kw.-hr./ton of pulp or 0.08 installed horsepower/ton of daily pulp capacity for oxidation, it was estimated that the use of mechanical foam breakers would no more than double the power requirements. Using the Borlew-Pascoe method of analysis for sodium sulphide in black liquor, it was determined that the unit in *one pass-through of liquor* is capable of oxidizing over 90 percent of the sodium sulphide at an inlet concentration of 12 grams Na_2S/liter and operates to oxidize 65 to 75 percent of 15 to 17 grams of Na_2S/liter. No appreciable benefits as regards pulp quality were observed during the period of operating the oxidation system and carrying a high sulphidity level. In fact, Collins indicates that too high a level of sulphidity may not be of benefit in effecting a lime or liquor saving and that increased corrosion may result in the system outside the vacuum and direct contact evaporators and scrubber. Studies indicated that on non-oxidized liquor the vacuum evaporator sulphur losses did not exceed 5 percent, and the high losses reported by others in the literature are evidently due to errors in analytical procedures for determining total sulphur in concentrated black liquor. Analysis of the vacuum evaporator jet condenser effluent and the condensate show even lower sulphur losses. On even partially oxidized liquor a very marked reduction in sulphur content of the evaporator condenser and condensate effluents resulted, and for completely oxidized liquor better than 90 percent reduction in sulphur loss can be achieved.

Collins *(5)* extended his investigations to include a study of sulphur losses from the recovery furnace, the disk evaporator, and the Venturi-Scrubber for fume recovery, before and when operating on oxidized black liquor. The data given shows that oxidation markedly reduces, if not completely eliminates, the loss of hydrogen sulphide from the liquor in the disk evaporator. The furnace produces either sulphur dioxide or hydrogen sulphide from both oxidized and non-oxidized liquor, depending on operation of the furnace between the extremes of excess air in the former case and insufficient air in the latter. Various mixtures of these gases are produced in the furnace between these extremes, and pre-oxidation of the black liquor may tend to throw the balance more toward sulphur dioxide due to the decomposition of thiosulphate rather than sulphide in the liquor. Because of the sulphur losses from the furnace, even with oxidation of the liquor, a new equilibrium sulphur balance for the mill is attained and the stack loss of sulphur is as great as ever unless the sulphur dioxide can be absorbed by adding alkali in the Venturi-Scrubber. In this paper by Collins *(5)* and the one by Collins and West *(3)*[1], the absorption of sulphur dioxide from stack gases by the Venturi-Scrubber is discussed. To minimize the loss of sulphur from the recovery furnace, it is suggested that the unit be operated with proper quantities of excess air and the stack gases be cleaned of fume and the liquor concentrated in a Venturi-Scrubber operating on concentrated (60-65 percent solids) oxidized black liquor to minimize the release of hydrogen sulphide and to obtain the maximum absorption of sulphur dioxide without addition of alkali in the scrubber, as must be done in a scrubber operating on fume solution.

Other Studies

Regestad *(55)* has reviewed the studies of analytical methods for oxidized black liquor by Bergstroem-Trobeck and Collins. The various oxidation systems in use are discussed, and the statements of Trobeck and von Essen regarding an increase in evaporator tube life as a result of black liquor oxidation are mentioned.

An early patent *(56)* mentioned that alkaline waste liquors may be purified by concentrating and heating them in the presence of added caustic while air is blown in until the organic substances carbonize. Oxidizing agents, such as saltpeter, may be added.

Chipman *(57)* in a study of the pollutional effects of sulphate mill effluents, noted that if black liquor is oxidized by bringing it in contact with oxygen and shaking for 90 hours, it loses its ability to repress the pumping of water by the oysters.

Another source *(58)* pointed out that the sodium sulphide in weak wash to the sewers is partly oxidized by the oxygen dissolved in the water.

Heath, Bray, and Curran *(59)* referred to the early work of Klason and Segerfelt *(60)* in which the change in black liquor when stored was first observed. Ordinarily, the sodium sulphide decreases and the sodium hydroxide increases, and this was attributed to the continuing reaction of the sulphide with the organic constituents of the black liquor. It apparently was not realized that oxidation of the sodium sulphide to thiosulphate would also release the caustic. Klason and Segerfelt *(60)* had also discovered that loss of active (sulphide) sulphur from

[1] Paper Trade J. 129, no. 9: 19-22; no. 10: 25-29 (September 1, 8, 1949).

kraft white liquor is due to oxidation.

It was found by Basberg *(61)* that, in the absence of air in a well closed container, black liquor sulphide content did not change on storage for five weeks.

Venemark *(62)* has stated that some of the sulphur compounds in black liquor are sensitive to air oxidation at ordinary temperatures and, if a sample is dried for a bomb calorimeter test, the heat value is lowered due to oxidation of some of the sulphur compounds by the air. It was suggested that oxidation of black liquor in the disk evaporators may be one of several reasons for the decrease in the heat value of the dry solids during evaporation. He pointed out that, when the evaporation is carried out with flue gases, the loss of sulphur occurs due to action of acidic gases on black liquor but oxidation by air or reaction with sulphur dioxide reduces this loss.

Of particular interest in connection with black liquor oxidation is the recovery process for sodium monosulphite or bisulphite liquors patented by Drewsen *(63)* a number of years ago. Spent sodium monosulphite liquor is concentrated and then burned in a reducing flame to produce an alkaline residue of high sodium sulphide content. The fused sodium sulphide is dissolved in water and mixed with powdered solid sodium monosulphite and subjected to a hot blast of air in a tank at 140 degrees Centrigrade. The sulphide is oxidized to sodium monosulphite which precipitates as the solution is evaporated by the hot air.

Mannbro Analysis

In connection with investigations of waste sulphite liquor as part of the cooking medium for sulphate pulp, Mannbro *(64, 65)* has worked out a method of analysis for the sulphide content. At the Östrands mill this method has been used for operating control of the black liquor oxidation system. Originally, the procedure called for the addition of $BaCl_2$ solution to a diluted solution of black liquor which was then made up to volume with freshly boiled and cooled distilled water. The precipitate was then removed by centrifuging the sample under kerosene or light mineral oil to protect it from the air. An aliquot of the supernatant liquor was then acidified with acetic acid and titrated with iodine using starch indicator. To reduce the error from sulphide loss upon acidification, the test was repeated by adding the liquor sample to most of the iodine mixed with acid and then completing the titration. Another sample of the supernatant liquor was boiled with ammonium chloride solution until the vapor produced no longer turned red litmus paper blue. The residual solution was then cooled and titrated with iodine. The iodine consumption of the samples before and after boiling with ammonium chloride equals the hydrogen sulphide in the black liquor.

Mannbro *(65)* has simplified the procedure by eliminating the treatment of the liquor sample with barium chloride followed by centrifuging. After boiling the sample with ammonium chloride where high sulphide content is present, it may be necessary to add more water and repeat the procedure to evolve the last traces of sulphide. In a study of the analytical procedure, analyses of a solution containing sodium sulphide and sodium thiosulphate gave correct results for these two compounds. Addition of sulphide and thiosulphate to black liquor also was accounted for by this method of analysis. No correction has been made for the sulphite content and the influence of the small amounts of other iodine-consuming materials present. In addition to the conventional method of expressing the percentage of oxidation as the amount of sodium sulphide oxidized as compared to its original content in the liquor, Mannbro has developed some rather interesting relationships. If the iodine consumption of a liquor sample is designated as a and the iodine consumption of the sample after boiling with ammonium chloride is b, and subscript 1 represents analysis *before* and subscript 2 analysis *after* oxidation of a black liquor sample, then,

$$\text{percent degree of oxidation} = \frac{(a_1 - b_1) - (a_2 - b_2)}{(a_1 - b_1)} \times 100$$

The ratio between values b and a is called the oxidation ratio. Thus

$$\text{Oxidation ratio} = \frac{b}{a} 100\%$$

For a completely oxidized black liquor, both degree of oxidation and oxidation ratio are 100 percent. With constant conditions of white liquor composition and pulping procedures, quite constant values of the oxidation ratio for unoxidized black liquor can be expected. As the oxidation ratio is not dependent upon the liquor concentration and changes occur during the oxidation due to changes in values of a and b, and relationship between degree of oxidation and oxidation ratio have been shown. Samples of black liquor were oxidized by bubbling oxygen into them at 90° C. under a reflux condenser to avoid loss of vapor. For the original liquors with a degree of oxidation of 0 percent, the oxidation ratio varied between 9.8 and 14.3 percent, but above 60 percent degree of oxidation the curves are practically identical. For comparison, a calculated curve for a liquor of an initial 10 percent oxidation ratio is given. Use of the method of analysis, including barium chloride treatment followed by centrifuging, yields a curve more nearly approximating the theoretical curve. The advantage claimed for the use of the conversion curve for a given mill is that the degree of oxidation can be determined by analysis of the oxidized liquor to determine the oxidation ratio, and thus analysis of the liquor entering the oxidation tower is not required.

Of interest in connection with the analytical procedure discussed by Mannbro is the prior work on this method of analysis carried out by Bergstroem and Trobeck *(66)*. In analyzing condensates from the digester house, a sample was boiled with ammonium chloride in a nitrogen atmosphere which split off hydrogen sulphide that was measured. The residual sample was then titrated with iodine and it was found that in this way almost all the iodine-consuming substances in the original sample were accounted for.

Bozza and Colombo *(67)* have considered the possibilities of black liquor oxidation. Using the analytical procedures of Bergstroem and Trobeck *(66)*, these authors made a laboratory study of the oxidation rate of the sulphide and mercaptans in black liquor. They found that the oxidation of the sulphide is a "monomolecular reaction" (first order reaction), but the oxidation of mercaptan is intermediate between a "monomolecular" and a "bimolecular" reaction. In order to study the retention of sulphur in black liquor by oxidation of the liquor, they distilled various liquor samples and dry residues from these samples at 650-700° C. in a current of nitrogen and analyzed the gases evolved. Oxidation resulted in a reduction in the amount of hydrogen sulphide evolved during the distillation but mercaptans were not affected. For this reason, they concluded that the mercaptan odor from the recovery would not be reduced by oxidation of the black liquor.

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Federal Paper Board Installs 10 Jacketed Driers . . . Re-Orders 58 More!

Lukenweld Rolls Boost Tonnage in 5 Different Plants!

The Federal Paper Board Company's first jacketed drier installation was on a Fourdrinier machine producing corrugating medium in its plant in Steubenville, Ohio. To raise production without increasing the size of the machine, 10 ordinary driers were replaced with 10 Lukenweld jacketed units. With the faster drying rates made possible by double-shell design, additional tonnage was achieved with no additional investment in either plant or machinery expansion.

To obtain similar results in paperboard production, Federal Paper Board then ordered the following installations of Lukenweld rolls for other plants:

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CITY.....STATE.....

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Bids and Awards

GPO 2nd Quarter, 1953 Paper Needs

WASHINGTON — Bids were received on March 9 by the Joint Congressional Committee on Printing for paper for the use of the Government Printing Office for a three-month period beginning April 1, 1953. Awards, announced March 23, are indicated by asterisks (*) before the names of the successful bidders in the tabulation herewith.

Newsprint

No. 1—40,000 lbs., 24x36—64; rolls, 19, 24, 36, 38, and 48 ins. wide; diameter, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.

* Perkins Goodman Co.	$.0620
Frank Parsons Paper Co., Inc.	.0624
Herman Scott Chalfont	.06325
Bermingham & Prosser Co.	.063
Old Dominion Paper Co.	.06479

No. 2—1,500,000 lbs., 24x36—64; rolls, 23, 34½, and/or 46 ins. wide; diameter, 37 ins. min. 39 ins. max. (returnable 3-inch iron or metal-capped fiber cores to be furnished by the contractor); min. order, 40,000 lbs.

* Perkins Goodman Co.	$.0620
Frank Parsons Paper Co., Inc.	.0624
Herman Scott Chalfont	.06325
Bermingham & Prosser Co.	.063

Machine-Finish Book

No. 5—1,100,000 lbs., 25x38—70; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, 40,000 lbs.

Wilcox-Walter-Furlong Paper Co.	$.11847
Barton Duer & Koch Paper Co. (250 tons only)	.1347
Walker Goulard Plehn Co. (300,000 lbs.)	.1192
Walker Goulard Plehn Co. (300,000 lbs.)	.1209
Walker Goulard Plehn Co. (balance)	.1219
Frank Parsons Paper Co., Inc.	.1284
Mudge Paper Co. (200 tons)	.1318
Meade Sales Co.	.1255
* Butler Co.	.1144

No. 6—20,000 lbs., 25x38—70; rolls, 9½ ins. wide; diameter, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 10,000 lbs.

Meade Sales Co.	$.1490
* Butler Co.	.1230

No. 7—475,000 lbs., 25x38—70; rolls, 19, 28½, and 38 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.

Wilcox-Walter-Furlong Paper Co.	$.1017
Barton Duer & Koch Paper Co.	.1266
Walker Goulard Plehn Co.	.1066
Frank Parsons Paper Co., Inc.	.1186
Bermingham & Prosser Co.	.1069
Meade Sales Co.	.1133
* Butler Co.	.0985

No. 9—200,000 lbs., 25x38—70; rolls, 22, 23, 33, 34½, 44 and 46 ins. wide, 37 ins. min., 39 ins. max. (returnable 3-inch iron or metal-capped fibre cores); min. order, 10,000 lbs.

Wilcox-Walter-Furlong Paper Co.	$.1017
Walker Goulard Plehn Co.	.1149
Bermingham & Prosser Co.	.1069
Meade Sales Co.	.1133
* Butler Co.	.0985

English-Finish Book

No. 12—20,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins., max. length, 56 ins.; min. order, 20,000 lbs.

Barton Duer & Koch Paper Co.	$.1310
Meade Sales Co.	.1268
* Butler Co.	.1268

Machina-Finish Book End Paper

No. 16—40,000 lbs., 25x38—160; flat, cut 38x50 ins.; the grain to run the 38-inch way of the sheet; min. order, 20,000 lbs.

Wilcox-Walter-Furlong Paper Co.	$.1336
Barton Duer & Koch Paper Co.	.1317
* Bermingham & Prosser Co.	.1207

Offset Book

No. 17—500,000 lbs., 25x38—80; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.

* Walker Goulard Plehn Co. (125,000 lbs.)	$.1351
Walker Goulard Plehn Co. (125,000 lbs.)	.1363
Walker Goulard Plehn Co. (125,000 lbs.)	.1373
Walker Goulard Plehn Co. (125,000 lbs.)	.1413
Stanford Paper Co. (200,000 lbs.)	.1394
Stanford Paper Co. (200,000 lbs.)	.1427
* Bermingham & Prosser Co.	.1356

No. 18—4,000,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.

R. P. Andrews Paper Co. (400,000 lbs.)	$.1332
The Whitaker Paper Co. (2,000,000 lbs. only)	.1355
* Walker Goulard Plehn Co. (500,000 lbs.)	.1192
* Walker Goulard Plehn Co. (500,000 lbs.)	.1194
* Walker Goulard Plehn Co. (500,000 lbs.)	.1196
* Walker Goulard Plehn Co. (500,000 lbs.)	.1198
* Walker Goulard Plehn Co. (500,000 lbs.)	.1203
Walker Goulard Plehn Co. (500,000 lbs.)	.1207
Walker Goulard Plehn Co. (500,000 lbs.)	.1211
Walker Goulard Plehn Co. (500,000 lbs.)	.1213
Stanford Paper Co. (500,00 lbs.)	.1205
Stanford Paper Co (500,000 lbs.)	.1255
Frank Parsons Paper Co., Inc.	.1279
* Bermingham & Prosser Co. (500,000 lbs.)	.1189
* Bermingham & Prosser Co. (500,000 lbs.)	.1199
Bermingham & Prosser Co. (500,000 lbs.)	.1219
Central Ohio Paper Co. (500,000 lbs. only)	.1208
* Fitchburg Paper Co. (800,000 lbs.)	.1192
Fitchburg Paper Co. (800,000 lbs.)	.1236
Fitchburg Paper Co. (800,000 lbs.)	.1268
Fitchburg Paper Co. (1,600,000 lbs.)	.1324

No. 19—110,000 lbs., 25x38—100; flat, cut 8x10½ ins.; the grain to run the 10½ inch way; min. order, 40,000 lbs.

The Whitaker Paper Co.	$.1455
* Walker Goulard Plehn Co.	.1307
Boston Paper Board Co.	.1475
Bermingham & Prosser Co.	.1359

No. 20—620,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.

R. P. Andrews Paper Co. (200,000 lbs.)	$.1274
The Whitaker Paper Co.	.1350
Walker Goulard Plehn Co.	.1201
Frank Parsons Paper Co., Inc.	.1279
Mudge Paper Co.	.1352
* Bermingham & Prosser Co.	.1179
Meade Sales Co.	.1329
Central Ohio Paper Co.	.1185
Fitchburg Paper Co.	.1192

No. 21—100,000 lbs., 25x38—160; flat, cut 34½x44 and 38x53 ins.; the grain to run lengthwise of the sheet; min. order, 20,000 lbs.

R. P. Andrews Paper Co.	$.1274
The Whitaker Paper Co.	.1305
Walker Goulard Plehn Co.	.1201
Bermingham & Prosser Co.	.1179
Central Ohio Paper Co.	.1185
* Fitchburg Paper Co.	.1177

Opacified Offset Book

No. 22—80,000 lbs., 25x38—120; flat, cut 21x32 ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.

Walker Goulard Plehn Co.	$.1749
* Central Ohio Paper Co.	.1297

Antique Book

No. 24—110,000 lbs., 25x38—90; flat, cut 32x42, and 38x50; min. order, 40,000 lbs.

Wilcox-Walter-Furlong Paper Co.	$.1240
R. P. Andrews Paper Co.	.1004
The Whitaker Paper Co.	.1225
Barton Duer & Koch Paper Co.	.1335

Cramped for space? PUT THAT NEW PUMP OUTDOORS!

ELLIOTT Outdoor Splashproof MOTOR

IT'S DELUGE-PROOF!

Elliott outdoor splashproof motor undergoing operating test under torrents of water, going strong after hours of deluge. When disassembled, windings were found completely dry.

● Weather doesn't matter to this motor. It gives you all the immunity to climatic extremes of totally enclosed construction, without the need for the expensive and complicated ventilation provisions of that design. A series of ingenious baffles shuts out snow, rain, sleet, dust, debris, fog, salt spray, etc., permitting entrance to cooling air only. For extremely dust-laden air, filters can be provided. No cored foundation is needed — a simple slab suffices.

This motor has proven itself in hundreds of outdoor installations in all parts of the country. Sizes from 150 hp to 3000 hp and even higher. Full details in the bulletin. Contact your local Elliott representative, or write Elliott Company, Ridgway, Pa.

ELLIOTT Company

R2-25 **RIDGWAY DIVISION**

ELLIOTT ELECTRICAL EQUIPMENT INCLUDES CROCKER-WHEELER INDUSTRIAL MOTORS

/Stanford Paper Co. .. .. .1072
Mudge Paper Co. .. .. .1200
Bermingham & Prosser Co. ..... .1213
Meade Sales Co. ..... .1259
* Butler Co. ..... .0957

No. 25—25,000 lbs., 25x38—120; flat, cut 32x42, 38x48, and 38x50 ins.; min. order, 20,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.1199
* R. P. Andrews Paper Co. ..... .1004
The Whitaker Paper Co. ..... .1199
Barton Duer & Koch Paper Co. .. .1335
Stanford Paper Co. ..... .1082
Bermingham & Prosser Co. ..... .1213

50% Antique Book

No. 30—50,000 lbs., 25x38—80; flat, cut 27x 40¾, 31½x46½, and 38x48 ins.; min. order, 20,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.2125
* Paper Corp. of U. S. ..... .1921
Howard Paper Mills, Inc.
(Aetna Div.) ..... .2018

No. 31—40,000 lbs., 25x38—80; shall be suitable for writing on with ink; flat, cut 22¾x31 ins.; min. order, 20,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.2125
* Paper Corp. of U. S. ..... .1921
Howard Paper Mills, Inc.
(Aetna Div.) ..... .2018

Water Resistant (Text) Book

No. 34—290,000 lbs., 25x38—120; flat, cut 32x42 and 35x45 ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.
The Whitaker Paper Co. .... $.1897
Stanford Paper Co. ..... .1740
Paper Corp. of U. S. ..... .1688
* Howard Paper Mills, Inc.
(Aetna Div.) ..... .1654
Mudge Paper Co.
(40,000 only—35x45 only) .... .1694

Supercalendered Book

No. 36—270,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.; min. order, 20,000 lbs.
Walker Goulard Plehn Co. ..... $.1211
Mudge Paper Co. ..... .1257
Meade Sales Co. ..... .1179
* Butler Co. ..... .1144

No. 37—620,000 lbs., 25x38—90; rolls, 19, 28½ and 38 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
Walker Goulard Plehn Co. ..... $.1066
Frank Parsons Paper Co., Inc. .. .1235
Meade Sales Co. ..... .1024
* Butler Co. ..... .0985

Coated Book

No. 39—1,100,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins.; min. order, 40,000 lbs.
* The Whitaker Paper Co. ..... $.1150
Walker Goulard Plehn Co.
(300,000 lbs.) ..... .1282
Walker Goulard Plehn Co.
(300,000 lbs.) ..... .1305
Walker Goulard Plehn Co.
(balance) .. .. .1329
Stanford Paper Co.
(300,000 lbs.) ..... .1223

No. 40—185,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.; min. order, 40,000 lbs.
* The Whitaker Paper Co. ..... $.1150
Walker Goulard Plehn Co. ..... .1329
Stanford Paper Co. ..... .1209
Meade Sales Co. ..... .1344

No. 41—70,000 lbs., 25x38—100; rolls, 28½ and 38 ins. wide; diameter, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
* The Whitaker Paper Co. ..... $.1045
Walker Goulard Plehn Co. ..... .1204
Meade Sales Co. ..... .1192

Goldenrod Coated Book

No. 42—7,000 lbs., 25x38—160; flat, cut 38x50 and 42x58 ins.; min. order, 2,000 lbs.
The Whitaker Paper Co. ..... $.1953
* Mudge Paper Co.
(Sample A) ..... .1895
Mudge Paper Co.
(Sample B) ..... .1945
Bermingham & Prosser Co. ..... .1969

No. 43—225,000 lbs., 25x38—140; flat, cut 32x42, 38x48, 39x50, and 42x64 ins.; grain: size 32x42 ins. to run the 42 inch way; other sizes to run the short way; min. order, 40,000 lbs.
The Whitaker Paper Co. ..... $.1615
* Walker Goulard Plehn Co. ..... .1383

Litho Coated Book

No. 46—140,000 lbs., 25x38—140; flat, cut 32x42, 35x45, 38x48, 39x50, and 41x52 ins.; the grain to run lengthwise of the sheet; min. order, 20,000 lbs.
The Whitaker Paper Co. ..... $.1665
Walker Goulard Plehn Co. ..... .1549
* Meade Sales Co. ..... .1545

Ground Wood Mimeograph Paper

No 49—75,000 lbs., No. 40; flat, cut 32½x42½ ins.; the grain to run lengthwise of the sheet; min. order, 20,000 lbs.
Barton Duer & Koch Paper Co. .. §$.1075
Barton Duer & Koch Paper Co. .. § .1110
Stanford Paper Co. ..... .1025
* Frank Parsons Paper Co. ..... .1004
Boston Paper Board Co. ..... .1200

Chemical Wood Mimeographed White and Colored

No. 50—390,000 lbs., white, No. 40; flat, cut 28½x34½, 32½x42½, 38x48½. Grain: size 28½x34½ ins. to run the 28½ in. way; size 32½x42½ ins. to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way; min. order, 40,000 lbs.
* R. P. Andrews Paper Co. ..... $.1059
The Whitaker Paper Co. ..... .1179
Barton Duer & Koch Paper Co. .. .1162
Walker Goulard Plehn Co. ..... .1163
Stanford Paper Co. ..... .1080
Frank Parsons Paper Co., Inc. .. .1068
Mudge Paper Co. ..... .1128
Eastern Corp. ..... .1333
Meade Sales Co. ..... .1324
Butler Co. ..... .10735

No. 51—450,000 lbs., No. 40; flat, cut 8x10½ ins.; grain 10½ inch way; min. order, 40,000 lbs.
* Wilcox-Walter-Furlong Paper Co. . $.1159
* R. P. Andrews Paper Co.
(100,000 lbs.) ..... .1149
R. P. Andrews Paper Co.
(350,000 lbs.) ..... .1333
The Whitaker Paper Co. ..... .1399
Barton Duer & Koch Paper Co. .. .1323
Walker Goulard Plehn Co. ..... .1174
Stanford Paper Co. ..... .1180
Boston Paper Board Co. ..... .1270
Eastern Corp. ..... .1460
Butler Co. ..... .11635

No. 52—55,000 lbs., blue, buff, green, pink and yellow, No. 40; flat cut 32½x42½, and 38x48½ ins. Grain: size 32½x42½ ins. to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way; min. order, one color, 10,000 lbs.
* Walker Goulard Plehn Co. ..... $.1423
Bermingham & Prosser Co. ..... .1425
Butler Co ..... .1448

25% Mimeograph

No. 53—115,000 lbs., No. 40; flat, cut 28½x34½, 32½x42½, 38x48½, and 40½x42½ ins. Grain: size 28½x34½ ins. to run the 28½ inch way; size 32½x42½ ins. and 40½x42½ ins. to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way; min. order, 20,000 lbs.
R. P. Andrews Paper Co. ..... $.1490
* Walker Goulard Plehn Co. ..... .1387
Paper Corp. of U. S. ..... .1477
Howard Paper Mills, Inc.
(Aetna Div.) ..... .1393

No. 54—20,000 lbs., No. 40; flat, cut 8x10¼ ins.; grain 10½ inch way; min. order, 20,000 lbs.
R. P. Andrews Paper Co. ..... $.1540
Walker Goulard Plehn Co. ..... .1473
Stanford Paper Co. ..... .1495
Paper Corp. of U. S. ..... .1527
* Howard Paper Mills, Inc.
(Aetna Div.) ..... .1433
Boston Paper Board Co. ..... .1750

Duplicator Copy Paper Liquid Process, White and Colored

No. 57—120,000 lbs., white; No. 40; flat, cut 32x42, 34x44 and 40x52½ ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.
* Walker Goulard Plehn Co. ..... $.1217
Eastern Corp. ..... .1333

No. 58—110,000 lbs., No. 40; flat, cut 8x10½ ins.; grain 10½ inch way; min. order, 40,000 lbs.
Walker Goulard Plehn Co. ..... $.1344
* Eastern Corp. ..... .1333

No. 59—40,000 lbs., pink, yellow, green and blue, No. 40; flat, cut 32x42, 34x44 and 40x52½ ins.; the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
* Walker Goulard Plehn Co. ..... $.1630

Chemical Wood Writing White and Colored

No. 61—265,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins.; max. width 48 ins.; min. order, 40,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.1583
Barton Duer & Koch Paper Co. .. .1575
Bulkley Dunton & Co. ..... .1340
Walker Goulard Plehn Co. ..... .1282
* Paper Corp. of U. S. ..... .1268
Frank Parsons Paper Co., Inc. .. .1268
Eastern Corp. ..... .1377

No. 62—3,150,000 lbs., white, No. 32; flat, cut any size min. width 21 ins., max. width 48 ins.; min. order, 40,000 lbs.
* R. P. Andrews Paper Co.
(600,000 lbs.) .. .. $.1084
R. P. Andrews Paper Co.
(600,000 lbs.) ..... .1357
The Whitaker Paper Co.
(800,000 lbs.) ..... .1360
Barton Duer & Koch Paper Co.
(250 tons only) ..... .1343
* Walker Goulard Plehn Co.
(500,000 lbs.) ..... .1089
* Walker Goulard Plehn Co.
(500,000 lbs.) ..... .1091
* Walker Goulard Plehn Co.
(500,000 lbs.) ..... .1093
* Walker Goulard Plehn Co.
(500,000 lbs.) ..... .1094
* Walker Goulard Plehn Co.
(500,000 lbs.) ..... .1096
* Walker Goulard Plehn Co.
(650,000 lbs.) ..... .1099
Stanford Paper Co.
(500,000 lbs.) ..... .1102
Frank Parsons Paper Co., Inc. .. .1392
Eastern Corp. ..... .1294

No. 64—2,400,000 lbs., No. 40; flat, cut any size, min. width, 21 ins., max. width 48 ins.; min. order, 40,000 lbs.
* R. P. Andrews Paper Co.
(600,000 lbs.) ..... $.1054
R. P. Andrews Paper Co.
(600,000 lbs.) ..... .1298
The Whitaker Paper Co.
(800,000 lbs.) ..... .1335
Barton Duer & Koch Paper Co.
(500 tons) ..... .1283
* Walker Goulard Plehn Co.
(500,000 lbs.) ..... .1073
* Walker Goulard Plehn Co.
(500,000 lbs.) ..... .1074
Walker Goulard Plehn Co.
(500,000 lbs.) .... .1076
Walker Goulard Plehn Co.
(400,000 lbs.) ..... .1079
Walker Goulard Plehn Co.
(500,000 lbs.) ..... .1083
* Stanford Paper Co.
(500,000 lbs. only) ..... .1063
Frank Parsons Paper Co. ..... .1332
Mudge Paper Co. (200 tons only) .1350
* Bermingham & Prosser Co.
(500,000 lbs.) ..... .1073
Bermingham & Prosser Co.
(500,000 lbs.) ..... .1098
Eastern Corp. ..... .1235

No. 65—140,000 lbs., white, No. 40; flat, cut 8x10½ ins.; min. order, 40,000 lbs.
R. P. Andrews Paper Co. ..... $.1225
The Whitaker Paper Co. ..... .1435
* Walker Goulard Plehn Co. ..... .1219
Boston Paper Board Co. ..... .1550
Eastern Corp. ..... .1362

No. 66—340,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width 48 ins., diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 20,000 lbs.
R. P. Andrews Paper Co. ..... $.1210
The Whitaker Paper Co. ..... .1214
Barton Duer & Koch Paper Co. .. .1238
* Walker Goulard Plehn Co. ..... .0963
Stanford Paper Co. ..... .1029
Bermingham & Prosser Co. ..... .1004
Eastern Corp. ..... .1191
Meade Sales Co. ..... .1259

No. 67—100,000 lbs., white, No. 32; rolls, min. width 21 ins., max. width 46 ins.; diameter, 37 ins. min., 39 ins. max. (returnable 3-inch iron or metal capped fiber cores); min. order, 20,000 lbs.
R. P. Andrews Paper Co. ..... $.1210
The Whitaker Paper Co. ..... .1214
* Walker Goulard Plehn Co. ..... .0963
Bermingham & Prosser Co. ..... .1004
Meade Sales Co. ..... .1259

No. 68—230,000 lbs., white, No. 40; rolls, min. width 16 ins., max. width 48 ins., diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 20,000 lbs.
R. P. Andrews Paper Co. ..... $.1151
The Whitaker Paper Co. ..... .1184
Barton Duer & Koch Paper Co. .. .1178
* Walker Goulard Plehn Co. ..... .0953
Stanford Paper Co. ..... .1005
Bermingham & Prosser Co. ..... .0974
Eastern Corp. ..... .1132
Meade Sales Co. ..... .1199

No. 69—100,000 lbs., No. 40; rolls, min. width 21 ins., max. width 46 ins., diameter, 37 ins. min., 39 ins. max: (returnable 3-inch iron or metal-capped fiber cores); min. order, 20,000 lbs.
R. P. Andrews Paper Co. ..... $.1151
The Whitaker Paper Co. ..... .1184
* Walker Goulard Plehn Co. ..... .0953
Bermingham & Prosser Co. ..... .0974
Meade Sales Co. ..... .1199

No. 70—60,000 lbs., blue, buff, green, pink, salmon and yellow, No. 26; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.
Walker Goulard Plehn Co. ..... $.1394
* Paper Corp. of U. S. ..... .1294
Eastern Corp ..... .1475

No. 71—330,000 lbs., blue, buff, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.
* Walker Goulard Plehn Co. ..... $.1174
Bermingham & Prosser Co. ..... .1177
Eastern Corp. ..... .1392

No. 72—360,000 lbs., blue, buff, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.
Bulkley Dunton & Co. ..... $.1340
* Walker Goulard Plehn Co. ..... .1147
Bermingham & Prosser Co. ..... .1155
Eastern Corp. ..... .1333

TO DO THE JOB RIGHT . . .

get the RIGHT tubing for the job!

NATIONAL SEAMLESS

DOING the job right doesn't necessarily mean using the most expensive stainless steel or the costliest alloy tubing for every job, regardless of the end function of the installation. That's waste . . . waste of money and waste of good tubing. When we talk about doing the job right, we mean we'll try to *fit the tubing to the job, not the job to the tubing.*

At your request, our specialists will analyze your problem. They'll give you the most expert advice available. If your installation calls for low carbon tubing, that's what our experts will specify. Their responsibility is to prescribe the most suitable materials for the job, at the lowest cost to you. They never lose sight of the fact that every installation is an individual problem in material selection and must be treated as such.

NATIONAL Tube manufactures seamless pipe and tubing in a complete range of steel analyses from low carbon, through the alloys on up to and including the stainless steels. In addition, the widest range of sizes and wall thicknesses are available for every mechanical and pressure purpose.

Bring your tubing problems to us. Let us put our experts' specialized knowledge to work on them. We'll recommend tubing that, at the lowest possible price, will do the best job for you.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
(TUBING SPECIALTIES)

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S NATIONAL *Seamless* PIPE AND TUBES

UNITED STATES STEEL

No. 74—40,000 lbs., white, No. 32; rolls, 36 ins. wide; diameter, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
* Walker Goulard Plehn Co. ..... $.1249
No. 77—30,000 lbs., white, No. 30; rolls, 22 ins. wide; diameter, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 20,000 lbs.
* Walker Goulard Plehn Co. ..... $.1253
Frank Parsons Paper Co. ..... .1254
Meade Sales Co. ..... .1292

50% Lithographed-Finish Map

No. 85—55,000 lbs., No. 32; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
Barton Duer & Koch Paper Co... $.2145
Stanford Paper Co. ..... .2051
Paper Corp. of U. S. ..... .1966
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1915
No. 84—20,000 lbs., No. 40; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
Barton Duer & Koch Paper Co... $.2145
Stanford Paper Co. ..... .2011
Paper Corp. of U. S. ..... .1940
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1895
No. 86—148,000 lbs., No. 56; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
Barton Duer & Koch Paper Co... $.2045
Stanford Paper Co. ..... .1971
Paper Corp. of U. S. ..... .1926
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1819

High Wet Strength Map

No. 88—230,000 lbs., No. 48; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet, unless otherwise specified (omit ream markers); min. order, 10,000 lbs.
Barton Duer & Koch Paper Co... $.1696
Walker Goulard Plehn Co. ..... .1749
Stanford Paper Co. ..... .1775
Paper Corp. of U. S. ..... .1670
* Fitchburg Paper Co. ..... .1522

Chemical Wood Manifold White and Colored

No. 97—195,000 lbs., No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.; min. order, 10,000 lbs.
* Walker Goulard Plehn Co. ..... $.1409
Patterson Parchment Paper Co... .1516
Frank Parsons Paper Co., Inc.... .1419
No. 99—20,000 lbs., No. 18; rolls, 22 ins. wide, 30 ins. diameter (3-inch fiber cores); min. order, 20,000 lbs.
Walker Goulard Plehn Co. ..... $.1343
* Frank Parsons Paper Co., Inc. .... .1337
No. 100—40,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18; flat, cut 28x34, 32x42 and 34x44 ins.; min. order, one color, 5,000 lbs.
* Walker Goulard Plehn Co. ..... $.1561
Frank Parsons Paper Co., Inc.... .1597

50% Manifold, White and Colored

No. 101—15,000 lbs., No. 14; flat, cut 32x42 ins.; min. order, 10,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.3224
* Barton Duer & Koch Paper Co. .3100
No. 102—30,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.; min. order, 10,000 lbs.
R. P. Andrews Paper Co. ..... $.4117
* Barton Duer & Koch Paper Co. ... .2485
Walker Goulard Plehn Co. ..... .2591
Paper Corp. of U. S. ..... .2930
Old Dominion Paper Co. ..... .259899
No. 103—10,000 lbs., No. 18; flat, cut 8x10½ ins.; min. order, 10,000 lbs.
R. P. Andrews Paper Co. ..... $.4367
* Barton Duer & Koch Paper Co. ... .2585
Walker Goulard Plehn Co. ..... .2672
Paper Corp. of U. S. ..... .3130
No. 104—25,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18; flat, cut 28x34, 32x42, and 34x44 ins.; min. order, one color, 5,000 lbs.
R. P. Andrews Paper Co. ..... $.4228
* Barton Duer & Koch Paper Co. ... .2585
Paper Corp. of U. S. ..... .3340
Old Dominion Paper Co. ..... .269989

50% White Glazed Manifold

No. 106—15,000 lbs., No. 16; flat, cut 32x42 ins.; min. order, 20,000 lbs.
* Barton Duer & Koch Paper Co... $.3240
Paper Corp. of U. S. ..... .3530

Chemical Wood Bond, White

No. 112—270,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, 40,000 lbs.
Wilcox-Walter-Furlong Paper Co. (100,000 lbs. only) ..... $.1259
R. P. Andrews Paper Co. ..... .1237
Walker Goulard Plehn Co. ..... .1237
Stanford Paper Co. ..... .1263
Eastern Corp. ..... .1333

Chemical Wood White Mimeograph Bond

No. 113—95,000 lbs., No. 40; flat, cut 32½x42½ and 40½x53 ins.; the grain to run lengthwise of the sheet; min. order, 20,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.1289
* Walker Goulard Plehn Co. ..... .1282
Eastern Corp. ..... .1333

25% Bond, White and Colored

No. 114—50,000 lbs., No. 26; flat, cut any size, min. width 21 ins.; max. width 48 ins.; min. order, 10,000 lbs.
* Barton Duer & Koch Paper Co. .. $.1890
Walker Goulard Plehn Co. ..... .1929
Stanford Paper Co. ..... .2132
Paper Corp. of U. S. ..... .1941
Howard Paper Mills, Inc. (Aetna Div.) ..... .1929
No. 116—420,000 lbs., No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, 20,000 lbs.
Walker Goulard Plehn Co. ..... $.1723
Stanford Paper Co. ..... .1732
Paper Corp. of U. S. ..... .1626
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1597
Frank Parsons Paper Co., Inc. (100,000 lbs. only) ..... .1826
Bermingham & Prosser Co. (100,000 lbs.) ..... .1599
Bermingham & Prosser Co. (100,000 lbs.) ..... .1619
No. 117—15,000 lbs., No. 32; flat, cut 8x10½ ins.; min. order, 10,000 lbs.
Walker Goulard Plehn Co. ..... $.1798
Stanford Paper Co. ..... .1842
Paper Corp. of U. S. ..... .1783
Howard Paper Mills, Inc. (Aetna Div.) ..... .1729
No. 118—600,000 lbs., No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, 20,000 lbs.
Walker Goulard Plehn Co. ..... $.1651
Stanford Paper Co. ..... .1950
Paper Corp. of U. S. (300,000 lbs.) ..... .1489
Paper Corp. of U. S. (300,000 lbs.) ..... .1508
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1463
Frank Parsons Paper Co. (200,000 lbs. only) ..... .1756
Butler Co. (100,000 lbs. only) ..... .15584
Butler Co. (200,000 lbs. only) ..... .15583
No. 119—75,000 lbs., No. 40; flat, cut 8x10½ ins.; min. order, 20,000 lbs.
Walker Goulard Plehn Co. ..... $.1749
Stanford Paper Co. ..... .2100
Paper Corp. of U. S. ..... .1601
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1583
No. 120—50,000 lbs., No. 32; rolls, 21, 22, and 26 ins. wide; diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 10,000 lbs.
Barton Duer & Koch Paper Co... $.1675
Walker Goulard Plehn Co. ..... .1623
Stanford Paper Co. ..... .1682
* Paper Corp. of U. S. ..... .1556
Howard Paper Mills, Inc. (Aetna Div.) ..... .1573
No. 122—20,000 lbs., medical form pink, green, yellow, cherry, No. 32; rolls, 26 ins. wide; diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 10,000 lbs.
* Barton Duer & Koch Paper Co. .. $.1695
Walker Goulard Plehn Co. ..... .1723
Paper Corp. of U. S. ..... .1706
Howard Paper Mills, Inc. (Aetna Div.) ..... .1719
No. 124—195,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.
Walker Goulard Plehn Co. ..... $.1823
Stanford Paper Co. ..... .1812
Paper Corp. of U. S. ..... .1690
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1659
Mudge Paper Co. (100,000 lbs.).. .1669
Mudge Paper Co. (95,000 lbs.).... .1681
No. 125—80,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.
Walker Goulard Plehn Co. ..... $.1776
Stanford Paper Co. ..... .1732
Paper Corp. of U. S. ..... .1628
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1583

100% White Bond

No. 133—3,000 lbs., No. 32; flat, cut any size, min. width 16 ins., max. width 38 ins.; min. order, 2,000 lbs.
* Barton Duer & Koch Paper Co. .. $.3900
Walker Goulard Plehn Co. ..... .3997
Stanford Paper Co. ..... .4200
Paper Corp. of U. S. ..... .4900
No. 134—5,000 lbs., No. 40; flat, cut any size, min. width 16 ins., max. width 38 ins.; min. order, 2,000 lbs.
R. P. Andrews Paper Co. ..... $.4290
Barton Duer & Koch Paper Co... .3900
* Walker Goulard Plehn Co. ..... .3897
Stanford Paper Co. ..... .4100
Paper Corp. of U. S. ..... .4800
No. 135—2,000 lbs., No. 64; flat, cut 34x44 ins.; min. order, 2,000 lbs.
* R. P. Andrews Paper Co. ..... $.4318

Chemical Wood White Ledger

No. 150—90,000 lbs., No. 48; flat, cut any size, min. width 17 ins., max. width 48 ins.; min. order, 20,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.1415
R. P. Andrews Paper Co. ..... .1271
Walker Goulard Plehn Co. ..... .1417
Frank Parsons Paper Co., Inc.... .1411
Eastern Corp. ..... .1382
* The Whitaker Paper Co. ..... .1243
No. 151—70,000 lbs., No. 64; flat, cut any size, min. width 17 ins., max. width 48 ins.; min. order, 10,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.1415
* The Whitaker Paper Co. ..... .1309
Walker Goulard Plehn Co. ..... .1467
Frank Parsons Paper Co., Inc.... .1411
Eastern Corp. ..... .1382
No. 153—25,000 lbs., No. 88; flat, cut any size, min. width 17 ins., max. width 48 ins.; min. order, 10,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.1415
Walker Goulard Plehn Co. ..... .1471
* Eastern Corp. ..... .1382

25% Ledger, White and Colored

No. 154—160,000 lbs., white, No. 48; flat, cut 28x34, 32x42, 34x44, and 38x48 ins.; min. order, 10,000 lbs.
Walker Goulard Plehn Co. ..... $.1659
Paper Corp. of U. S. ..... .1531
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1479
Frank Parsons Paper Co. Inc..... .1766
No. 155—120,000 lbs., white, No. 64; flat, cut 28x34, 32x42, 34x44, and 38x48 ins.; min. order, 10,000 lbs.
Walker Goulard Plehn Co. ..... $.1659
Stanford Paper Co. ..... .1800
Paper Corp. of U. S. ..... .1527
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1479
Frank Parsons Paper Co. Inc..... .1766
No. 156—40,000 lbs., No. 88; flat, cut 28x34, 32x42, 34x44 and 38x48 ins.; min. order, 10,000 lbs.
Walker Goulard Plehn Co. ..... $.1659
Stanford Paper Co. ..... .1670
* Paper Corp. of U. S. ..... .1554
Howard Paper Mills, Inc. (Aetna Div.) ..... .1594
No. 157—50,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 64; flat, cut 34x44 ins.; min. order, one color, 10,000 lbs.
Barton Duer & Koch Paper Co... $.1735
Walker Goulard Plehn Co. ..... .1722
Paper Corp. of U. S. ..... .1591
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1584
No. 158—35,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 88; flat, cut 34x44 ins.; min. order, one color, 10,000 lbs.
Barton Duer & Koch Paper Co... $.1750
Walker Goulard Plehn Co. ..... .1722
Stanford Paper Co. ..... .1920
Paper Corp. of U. S. ..... .1684
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1669

100% White Ledger

No. 177—10,000 lbs., No. 64; flat, cut 28x34, 32x42, and 34x44 ins.; min. order, 10,000 lbs.
R. P. Andrews Paper Co. ..... $.4116
* Barton Duer & Koch Paper Co. ... .3730
Walker Goulard Plehn Co. ..... .3797
Stanford Paper Co. ..... .3940
Paper Corp. of U. S. ..... .4490
No. 178—10,000 lbs., No. 88; flat cut 22¾x31 and 34x44 ins.; min. order, 5,000 lbs.
R. P. Andrews Paper Co. ..... $.4116
* Barton Duer & Koch Paper Co. ... .3730
Walker Goulard Plehn Co. ..... .3999
Stanford Paper Co. ..... .3940
Paper Corp. of U. S. ..... .4490

Chemical Wood, White and Colored Index

No. 182—460,000 lbs., white, 25½x30½—220; flat, cut 32x42 and 34x44, and 39x50 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.1331
R. P. Andrews Paper Co. ..... .1522
The Whitaker Paper Co. ..... .1290
Walker Goulard Plehn Co. ..... .1192
* Stanford Paper Co. ..... .1174
Frank Parsons Paper Co. ..... .11635
No. 183—35,000 lbs., single-ply, 25½x30½—280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
Wilcox-Walter-Furlong Paper Co. $.1331
R. P. Andrews Paper Co. ..... .1429

Large diameter

TRENTWELD STAINLESS TUBING

for your requirements

TRENTWELD Large Diameter Stainless Steel Tubing meets precisely the tubing requirements of fabricators, designers and manufacturers of processing equipment. Available in diameters of 4″ to 40″ OD, TRENTWELD is precision-finished with absolutely uniform section. TRENTWELD is furnished in any finish, for fabrication with any fittings you select. Call on us.

CONDENSING LOOPS FOR HANDLING MERCURY VAPOR AT A WESTERN MINE. FABRICATED OF CR-NI STAINLESS STEEL.

TRENTWELD

STAINLESS STEEL TUBING

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA)

Walker Goulard Plehn Co..... .1291
* Stanford Paper Co. ..... .1225

No. 184—10,000 lbs., white, single-ply, 25½x30½—340; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
* R. P. Andrews Paper Co. ..... $.1429

No. 185—80,000 lbs., buff, single-ply, 25½x30½—220; flat, cut 32x42 ins., with projecting colored-paper marker between each 100 sheets; min. order, 20,000 lbs.
Wilcox-Walter-Furlong Paper Co.. $.1365
R. P. Andrews Paper Co..... .1518
The Whitaker Paper Co..... .1390
* Walker Goulard Plehn Co. .... .1247

50% Index, White and Colored

No. 188—215,000 lbs., white, 25½x30½—220; flat, cut 32x42, 32x48, and 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
Barton Duer & Koch Paper Co... $.1745
Walker Goulard Plehn Co. ..... .1831
Paper Corp. of U. S. (115,000 lbs.) ..... .1703
Paper Corp. of U. S. (200,000 lbs.) ..... .1743
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1654

No. 189—30,000 lbs., white, single-ply, 25½x30½—280; flat, cut 32x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
Barton Duer & Koch Paper Co... $.1774
Walker Goulard Plehn Co..... .1866
* Paper Corp. of U. S. ..... .1773

No. 190—10,000 lbs., white, 25½x30½—340; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
Walker Goulard Plehn Co..... $.2086
* Paper Corp. of U. S. ..... .2038

No. 191—125,000 lbs., blue, buff, cherry fawn, green, pink, salmon and yellow; 25½x30½—220; flat, cut 32x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, one color, 10,000 lbs.
Barton Duer & Koch Paper Co... $.1801
Walker Goulard Plehn Co... ... .1888
Paper Corp. of U. S..... .1766
* Howard Paper Mills, Inc. (Aetna Div.) ..... .1704

No. 192—20,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow; 25½x30½—280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, one color, 5,000 lbs.
Barton Duer & Koch Paper Co... $.1910
Walker Goulard Plehn Co..... .2096
* Paper Corp. of U. S. ..... .1977

100% Cream-White Index

No. 196—60,000 lbs., single-ply, 25½x30½—250; flat, cut 20½x30 ins.; min. order, 20,000 lbs.
R. P. Andrews Paper Co..... $.3928
* Barton Duer & Koch Paper Co. .. .3535
Walker Goulard Plehn Co..... .3631
Stanford Paper Co..... .3770
Paper Corp. of U. S..... .4144

Coated Cover, White and Colored

No. 200—50,000 lbs. white, 20x26—120; flat, cut 26½x41 and 34x44 ins.; the grain to run lengthwise of the sheet; min order, 10,000 lbs.
* Bermingham & Prosser Co. ..... $.1419

Antique-Finish Cover, White and Colored

No. 202—45,000 lbs., 20x26—100; flat, cut 25¼x39 and 34x44 ins.; the grain to run lengthwise of the sheet; min. order, 20,000 lbs.
Wilcox-Walter-Furlong Paper Co.. $.1299
R. P. Andrews Paper Co..... .1293
The Whitaker Paper Co..... .1435
* Walker Goulard Plehn Co. ..... .1197
Eastern Corp. ..... .1504

No. 205—130,000 lbs., 20x26—100; blue, buff, dawn, quaker drab, terra cotta, gray, brown, green, gobelin blue, granite, tea, and canary; flat, cut 25¼x39 and 34x44 ins.; min. order, one color, 10,000 lbs.
* The Whitaker Paper Co. ..... $.1322
Walker Goulard Plehn Co..... .1462
Frank Parsons Paper Co. Inc.... .1357

50% Laid Antique-Finish Cover, Colored

No. 206—60,000 lbs., blue, cream, white, gray, and green; 20x26—130; flat, cut 25¼x39 and 34x44 ins.; the grain to run lengthwise of the sheet; the laid lines to run the short direction of the sheet; min. order, one color, 5,000 lbs.
Walker Goulard Plehn Co. ..... $.2290
* Paper Corp. of U. S. ..... .2024
Frank Parsons Paper Co. Inc.... .2079

Wood Manila

No. 208—135,000 lbs., 24x36—80; flat, cut 25x38, 32x42, and 40x52½ ins.; min. order, 20,000 lbs.
The Whitaker Paper Co..... $.1020
* Barton Duer & Koch Paper Co. .. .0910
Bulkley Dunton & Co. ..... .0974
Walker Goulard Plehn Co..... .1192
Stanford Paper Co..... .1000
Frank Parsons Paper Co., Inc. .... .0949
Boston Paper Board Co..... .1100
Bermingham & Prosser Co..... .1075

Chemical Wood Manila

No. 215—10,000 lbs., 24x36—140; flat, cut 32x42 ins.; min. order, 10,000 lbs.
* Mudge Paper Co. ..... $.1640

Rope Manila

No. 215—5,000 lbs., 24x36—160; rolls, 48 ins. wide; diameter 28 ins. min., 30 ins. max. (3-inch fiber cores); min. order, 5,000 lbs.
* R. P. Andrews Paper Co. (215 & 217—both or none).... $.3100
Paper Corp. of U. S..... .3375

Drumhead Manila

No. 217—5,000 lbs., 24x36—280; flat, cut 32x42 ins.; min. order, 5,000 lbs.
* R. P. Andrews Paper Co. (215 & 217—both or none).... $.3100
Paper Corp. of U. S..... .3521

No. 2 Kraft

No. 218—35,000 lbs., 24x36—80; flat, cut any size, max. length 56 ins., in bundles wrapped and tied; min. order, 10,000 lbs.

No. 218—25,000 lbs., 24x36—100; flat, cut any size, max. length 56 ins., in bundles wrapped and tied; min. order, 10,000 lbs.

No. 218—45,000 lbs., 24x36—120; flat, cut any size, max. length 56 ins., in bundles wrapped and tied; min. order, 10,000 lbs.

No. 218—20,000 lbs., 24x36—140; flat, cut any size, max. length 56 ins., in bundles wrapped and tied; min. order, 10,000 lbs.

No. 218—10,000 lbs., 24x36—160; flat, cut any size, max. length 56 ins., in bundles wrapped and tied; min. order, 10,000 lbs.
* Frank Parsons Paper Co., Inc. (80 lb.) ..... $.07825
* Frank Parsons Paper Co., Inc. (100 lb.) ..... .07535
* Frank Parsons Paper Co., Inc. (120 lb.) ..... .07535
* Cauthorne Paper Co. (140 lb.) ..... .0779
* Cauthorne Paper Co. (160 lb.) ..... .0768

No. 219—10,000 lbs., 24x36—120; cut any size, folded (25 sheets per fold), in wrapped bundles; min. order, 5,000 lbs.
* Frank Parsons Paper Co., Inc. .. $.0779

No. 220—70,000 lbs., 24x36—80; 9 and 11 ins. wide, min. 28 ins., max. 30 ins. in diameter; rolls, wound on wooden plugs 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.

No. 220—20,000 lbs., 24x36— , 12⅝ ins. wide, min. 21 ins., max. 22 ins. in diameter; rolls, wound on wooden plugs 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.

No. 220—15,000 lbs., 24x36—80; 17¼ ins. wide, min. 21 ins., max. 22 ins. in diameter; rolls, wound on wooden plugs 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.

No. 220—10,000 lbs., 24x36—160; 36 and 48 ins. wide, min. 28 ins., max. 30 ins. in diameter; rolls, wound on wooden plugs 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.
Frank Parsons Paper Co. Inc. (80 lb.) ..... $.07535
Frank Parsons Paper Co. Inc. (80 lb.) ..... .07435
* Cauthorne Paper Co. (80 lb.) ..... .0743
* Cauthorne Paper Co. (160 lb.) ..... .0743

White Gummed

No. 252—300,000 sheets (ungummed), No. 36; flat, cut 22x34 ins.; min. order, 25,000 sheets.
R. P. Andrews Paper Co. (per M sheets) $21.92
Barton Duer & Koch Paper Co. (per M sheets) 22.13
Bulkley Dunton & Co. (per M sheets) 18.919
Stanford Paper Co. (per M sheets) 25.90
Paper Corp. of U. S. (per M sheets) 21.92
* Mudge Paper Co. (per M sheets) 18.21
Bermingham & Prosser Co. (per M sheets) 21.89
Old Dominion Paper Co. (per M sheets) 22.084

Desk Blotting, Colored

No. 255—20,000 lbs., light green, 19x24—200; flat, cut 19x24 ins., in bundles wrapped and tied; min. order, 10,000 lbs.
R. P. Andrews Paper Co..... $.1250
* The Whitaker Paper Co. .. .. .1250
Bulkley Dunton & Co..... .12729
Hyman Viener & Sons..... .1271
Walker Goulard Plehn Co... ... .1397
Stanford Paper Co..... .1400
Paper Corp. of U. S. (Moss Green) ..... .1600
Paper Corp. of U. S. (Pea Green) ..... .1550
Frank Parsons Paper Co. Inc.... .1494
Bermingham & Prosser Co..... .1398
Old Dominion Paper Co..... .149699

High-Finish Red Wallet Board

No. 265—5,000 lbs., 24-36—320; flat, cut 38x48 ins., in bundles wrapped and tied; min. order, 5,000 lbs.
* R. P. Andrews Paper Co. ..... $.1406
Paper Corp. of U. S..... .1582

High-Finish Chemical Wood Manila Tag

No. 271—30,000 lbs., 24x36—280; flat, cut 28x34 and 38x48 ins.; min. order, 20,000 lbs.
R. P. Andrews Paper Co..... $.1199
The Whitaker Paper Co. ..... .1278
Walker Goulard Plehn Co..... .1273
* Paper Corp. of U. S. ..... .1149

Jute Tag

No. 280—25,000 lbs., 22½x28½—200; flat, cut 34x44 ins.; min. order, 10,000 lbs.
R. P. Andrews Paper Co. ..... $.1701
* Paper Corp. of U. S. ..... $.1690

No. 281—10,000 lbs., 22½x28½—280; flat, cut 34x44 ins.; min. order, 10,000 lbs.
* Paper Corp. of U. S. ..... .1690

Railroad Board, White and Colored

No. 301—20,000 sheets, white; flat, 22x34 ins., 4-ply, each 100 sheets fully banded; min. order, 10,000 sheets.
* Walker Goulard Plehn Co. (per M sheets) $57.03

No. 302—15,000 sheets, white; flat, 22x34 ins., 8-ply, each 100 sheets fully banded; min. order, 5,000 sheets.
* Walker Goulard Plehn Co. (per M sheets) $87.61

No. 303—5,000 sheets, white; flat, 22x34 ins., 14-ply, each 50 sheets fully banded; min. order, 5,000 sheets.
* Walker Goulard Plehn Co. (per M sheets) $123.49

No. 304—11,000 sheets, ash gray, green, orange, and red; flat, 22x34 ins., 4-ply, each 100 sheets fully banded; min. order, one color, 5,000 sheets.
* Walker Goulard Plehn Co. (per M sheets) $61.38

No. 305—7,000 sheets, buff, flat, 22x28 ins., 14-ply, each 50 sheets fuly banded; min. order, one color, 5,000 sheets.
* Walker Goulard Plehn Co. (per M sheets) $106.49

Wood Cardboard, Colored

No. 306—40,000 lbs., buff, 22½x28½—150; rolls, 20 and 23 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
Barton Duer & Koch Paper Co... $.0785
Bulkley Dunton & Co..... .0838
* Hyman Viener & Sons ..... .0773
Walker Goulard Plehn Co..... .0781
Frank Parsons Paper Co. Inc.... .0990
Bermingham & Prosser Co..... .0875

No. 307—60,000 lbs., buff, 22½x28½—150; flat, cut 32x42 ins.; min. order, 20,000 lbs.
The Whitaker Paper Co..... $.1058
Barton Duer & Koch Paper Co... .0935
Bulkley Dunton & Co..... .0973
Hyman Viener & Sons..... .0888
* Walker Goulard Plehn Co. ..... .0881
Frank Parsons Paper Co. Inc.... .1100
Bermingham & Prosser Co..... .0975

No. 308—10,000 lbs., melon; 22½x28½—184; flat, cut 20x30 ins.; min. order, 10,000 lbs.
* Hyman Viener & Sons ..... $.0988
Bermingham & Prosser Co..... .1000

No. 309—25,000 lbs., blue, buff, green, melon, pink and yellow; 22½x28½—184; rolls, 20 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, one color, 10,000 lbs.
Hyman Viener & Sons.. ..... $.0963
* Bermingham & Prosser Co. ..... .0950

Chemical Wood Tan Board

No. 310—200,000 lbs., 22½x28½—200; flat, cut 25x38 ins. grain long, 28x38 ins. grain short, and 34x44 ins. grain long; min. order, 10,000 lbs.
R. P. Andrews Paper Co... ..... $.1238
The Whitaker Paper Co..... .1278
Walker Goulard Plehn Co..... .1234
Paper Corp. of U. S..... .1400
Mudge Paper Co. ..... .1275
* Old Dominion Paper Co. ..... .115799

United States Postal Card Paper

No. 325—3,000,000 lbs., 22½x28½—188; rolls, 33 ins. wide, diameter 34 ins. min., 36 ins. max. (6-inch iron or metal capped returnable fiber cores); min. order, 40,000 lbs.
* R. P. Andrews Paper Co. (2,200,000 lbs.) ..... $.0970
The Whitaker Paper Co..... .0998
* Frank Parsons Paper Co., Inc. (1,200,000 lbs.) ..... .0965

NEW CHAPTERS IN AN OLD STORY*

From knowledge gained by long experience, Niagara is constantly adding new chapters to the continued story of chemicals in industry.

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Unsurpassed for purity and uniformity, NIALK Liquid Chlorine acts smoothly, rapidly and with predictable results, is widely used by the paper industry to realize the full potential of the newest bleaching methods.

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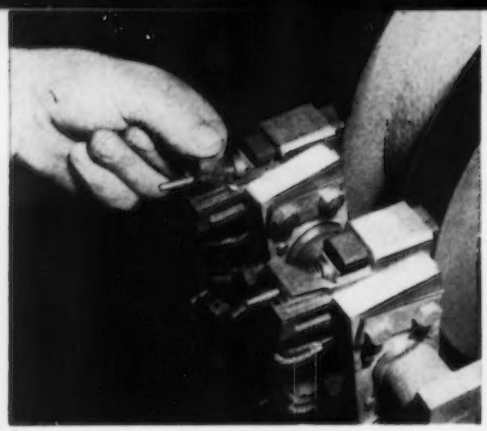
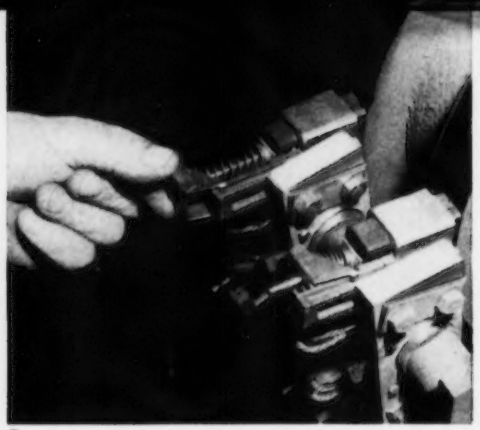
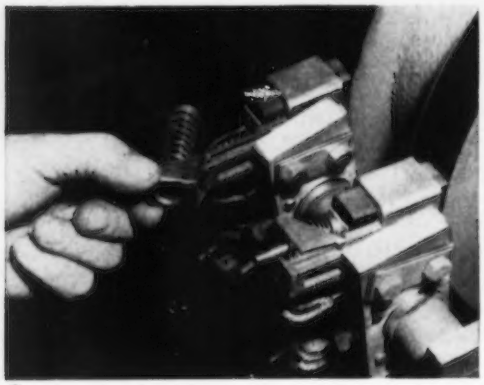
NIALK CARBONATE OF POTASH · NIALK PARADICHLOROBENZENE
NIALK CAUSTIC SODA · NIALK TRICHLORethylene
NIAGATHAL · (TETRACHLORO PHTHALIC ANHYDRIDE)



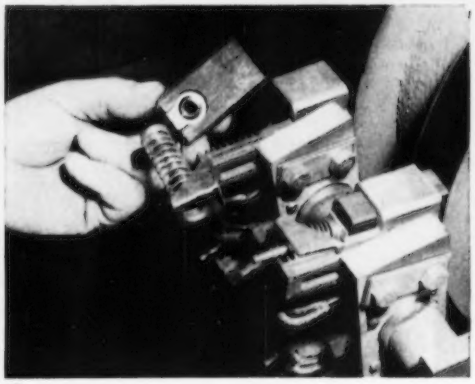
1 To reset brush tension, operator releases spring lock . . .



2 slides it back to relieve pressure . . .



3 and swings locking device to one side . . .

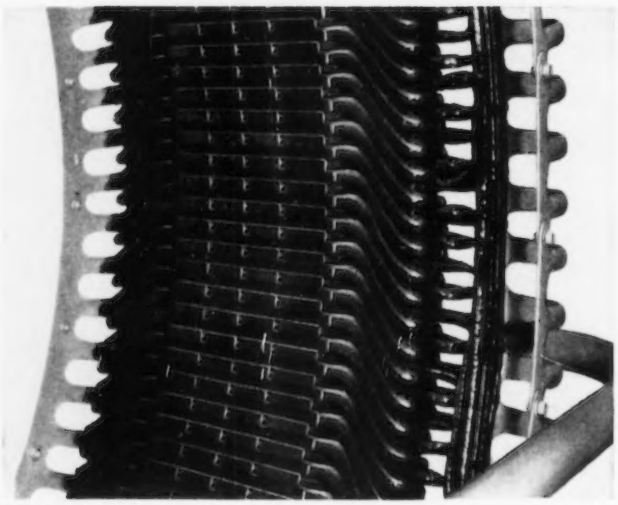


4 for fast and easy brush removal.

BRUSH-PRESSURE ADJUSTMENT, for maximum brush life, and replacement, to assure reliable motor service, are simple matters on G-E synchronous motors. A calibrated spring-loaded brush holder makes resetting brush tension or removal of brushes fast and easy. Brushes are staggered for even brush-ring wear.

See How Routine Maintenance Is

BEARING LUBRICATION can be readily checked through a large sight-level gage on the bearing pedestal; and when oil is required, handy snap-top covers are provided for easy refilling, as well as oil-ring inspection. A drain plug is conveniently located for quick oil changes.



INSULATION CLEANING is fast on G-E synchronous motors. Windings are coated with a high-gloss Glyptal* varnish that resists the accumulation of dust and can be vacuum or air cleaned in most applications. In extremely dusty or oily atmospheres, deposits can be easily wiped from the windings. Clean windings mean longer insulation and machine life.

*Reg. trademark of General Electric Co.

THIS G-E SYNCHRONOUS MOTOR, RATED 4500 HP, 300 RPM, DRIVES A RECIPROCATING GAS COMPRESSOR.

Easier on G-E Synchronous Motors!

Routine maintenance involves three factors: brushes, lubrication, and insulation. To be sure that these areas are properly serviced, G-E synchronous motors have design features that make checking easy and maintenance fast. Close at hand and easy to adjust, the brush-rigging construction encourages your maintenance men to inspect regularly. Oil-level gage and inspection caps are arranged for quick checking and filling when necessary. The high-gloss insulation on G-E synchronous motor windings resists the adhesion of dust and minimizes the need for cleaning.

These features promote long, reliable motor service and save valuable time for your maintenance crews.

Before selecting your next heavy-duty motor, be sure to consider these important maintenance features. Call in your G-E representative. He will be glad to discuss the many money-saving applications for G-E synchronous motors. Meanwhile, you can obtain more information on G-E synchronous motors by requesting the following publications: GEA-5332, "Low-speed Synchronous Motors" or GEA-5426, "High-speed Synchronous Motors." Write to Section 770-28, General Electric Company, Schenectady 5, N. Y.

You can put your confidence in—

GENERAL ELECTRIC

No. 327—80,000 lbs., 22½x28½—188; rolls, 22 ins. wide, diameter 34 ins. min., 36 ins. max. (6-inch iron or metal capped returnable fiber cores); min. order, 40,000 lbs.
* R. P. Andrews Paper Co. ..... $.0970

No. 328—10,000 lbs., white, 22½x35—220; flat, cut 34x44 ins., the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
* R. P. Andrews Paper Co. ..... $.1554
Walker Goulard Plehn Co..... .1740
Paper Corp. of U. S..... .1918

Folding Bristol, White and Colored

No. 329—10,000 lbs., gray, 22½x35—300; flat, cut 35x45 ins., the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
* R. P. Andrews Paper Co. ..... $.1594
Walker Goulard Plehn Co..... .1815
Paper Corp. of U. S..... .2018
Mudge Paper Co..... .1614

Pressboard, Colored

No. 351—7,000 sheets, red; flat, cut 30x36 ins., thickness .0140 inch; min. order, 5,000 sheets.
* R. P. Andrews Paper Co.
(per M sheets) $18.85

No. 352—40,000 sheets, gray; flat, cut 29¼x34¼ ins., thickness .0300 inch; min. order, 5,000 sheets.
R. P. Andrews Paper Co.
(per M sheets) $39.70
* Barton Duer & Koch Paper Co.
(per M sheets) $27.33

Newsboard

No. 360—235,000 lbs., 26x38; No. 100; flat, cut any size, min. width 21 ins., max. width 42 ins. (To be guillotine-trimmed square on four sides.) min. order, 10,000 lbs.
* R. P. Andrews Paper Co. ..... $.03475
The Whitaker Paper Co..... .03536
Stanford Paper Co..... .03949
Paper Corp. of U. S..... .0366
Old Dominion Paper Co..... .036444
Mathers Lamm Paper Co..... .0380

Binder's Board, No. 1 Quality

No. 366—[a] 180,000 lbs., No. 1, 25¼x30¼ ins., Nos. 12, 17, 19, 21, 25, 31, and 41; flat, to trim 25x30 ins. for all boards, and to trim 34x44 ins. (Nos. 12 and 21 only); min. shipment, 20,000 lbs.; min. order, any one board number, 5,000 lbs.
* R. P. Andrews Paper Co. ..... $.05825
Barton Duer & Koch Paper Co. .. .06995

No. 367—[b] 145,000 lbs., No. 1, 25¼x30¼ ins., Nos. 21, 25, 31, and 41; flat to trim 25¼x37¼ ins.; min. order, 20,000 lbs.
* R. P. Andrews Paper Co. ..... $.05825
Barton Duer & Koch Paper Co. .. .06995

Chestnut Cover Board

No. 369—[a] 180,000 lbs., 25¼x30¼ ins., Nos. 12, 17, 19, 21, 25, 31, and 41; flat to trim 25x30 ins. for all boards, and to trim 34x44 ins. (Nos. 12 and 21 only); min. shipment, 20,000 lbs.; min. order, any one board number, 5,000 lbs.
No Award
Mead Board Sales, Inc..... $.0593

No. 370—[b] 145,000 lbs., 25¼x30¼ ins., Nos. 21, 25, 31, and 41; flat, to trim 25¼x37¾ ins.; min. order, 20,000 lbs.
No Award
Mead Board Sales, Inc..... $.0593

[a] Total tonnage to be awarded on Lots 366 and/or 369 will be 180,000 pounds. Award will be made in the best interests of the Government price-wise on comparable items of either Binder's Board, No. 1 quality, or Chestnut Cover Board.

[b] Total tonnage to be awarded on Lots 367 and/or 370 will be 145,000 pounds. Award will be made in the best interests of the Government price-wise on comparable items of either Binder's Board, No. 1 quality, or Chestnut Cover Board.

PAPER PEOPLE

J. & J. Rogers Changes

The following changes in, and additions to, personnel have been made at the J. & J. Rogers Co., Au Sable Forks, N. Y.

John R. Rogers has been advanced to assistant manager and purchasing agent. Thomas Parkhill and Ralph Prince have been added to the staff, the former as paper mill superintendent, and the latter as technical superintendent.

Mr. Rogers has been with J. & J. Rogers since 1929, starting as assistant superintendent in the sulphite mill. In 1931 he became superintendent. In 1944 he became assistant superintendent at the paper mill. In 1947 he was made superintendent, which job he has held ever since.

Mr. Parkhill had 27 years experience with the Strathmore Paper Co., which he left to go into business for himself. For two years recently he was manager of the Monadnock Paper Mills, Inc., at Bennington, N. H., before coming to the Rogers company where he took up his position the first of February.

Ralph N. Prince worked as chemist and in various other capacities with the Fort Orange Paper Co., Castleton, N. Y., for 10 years. He left there to engage in industrial research work at the University of New Hampshire, Durham, N. H., leaving there to assume sales-service work for the American Cyanamid Co. He was with American Cyanamid for the last 8 years. For the last 5 years he has been Secretary-Treasurer of the Empire State Section of TAPPI.

Heath To Sell Soundview Pulp

Scott Paper Co., Chester, Pa., has appointed Russell M. Heath as manager of pulp sales of its Soundview division. Mr. Heath, who was general manager of the pulp and paper plant of a Scott subsidiary at Marinette, Wis., will make his headquarters at Chester, Pa.

C-Z Transfers Osborne

Donald L. Osborne, personnel and safety supervisor at Crown Zellerbach Corporation., Port Townsend, Wash., will leave April 1 for West Linn, Ore., where he will take over the position of training supervisor of that division. Pending a permanent appointment, his assistant, Frank Kilham, will succeed him at Port Townsend.

W. H. Harding On Chemical Society Editorial Board

William H. Harding, director of research of the National Gypsum Co., Buffalo, N. Y., has been appointed a member of an eight-man editorial advisory board for publications of the American Chemical Society.

Moon Named Gen. Supt. of National Paper Corp.

Willard H. Moon, formerly with Superfine Paper Mills, Clayville, N. Y., has recently been made general superintendent of National Paper Corp. of Pa., Ransom, Pa.

Herbolzheimer Transferred to Marinette

Fred Herbolzheimer is leaving Scott Paper Co., Chester, Pa., to become technical director of Marinette Paper Co., Marinette, Wis.

Howard Paper Elections

Howard Paper Mills, Inc., Dayton, Ohio, elected the following to the board of directors to serve for the coming year: Blanche C. Hoffman, Lebanon, Ohio; Madeleine Rose Hoffman, Cincinnati, Ohio; Eunice Howard Dane, New York, N. Y.; Eugene H. Hoffman, Lebanon, Ohio; Harry A. Legge, Urbana, Ohio; W. B. Zimmerman, Franklin, Ohio; Stanley M. Rose, Cincinnati, Ohio; John C. Sturgis, Kenilworth, Ill.; Herman W. Santen, Cincinnati, Ohio; Kenneth P. Geohegan, Dayton 6, Ohio.

The following officers were elected for the ensuing year: president, Harry A. Legge; executive vice-president,

Brown Appoints Nelson

N. C. Nelson

Nicholas C. Nelson has been named manager of the Foreign Sales Division of Brown Co. with offices at 150 Causeway street, Boston, Mass.

Mr. Nelson is familiar with the exporting phase of the paper industry, having served in an administrative capacity in the Philippine Islands for Bulkley Dunton Co., Inc. While employed as consultant with the San Miguel Brewery, Inc., he made an extensive market survey and analysis in the paper field. He also has served as manager of total operations in Peru for Wessel, Duval and Co.

HIGHLY RECOMMENDED

for low cost service

CRANE

IRON BODY—WEDGE DISC

Clamp Gate Valves

Crane Wedge Disc Clamp Gate Valves come in OS&Y, inside screw, and quick-opening patterns, all-iron or brass trimmed, screwed or flanged end. Sizes up to 4 in. Working pressures up to 150 p.s.i. saturated steam, 225 p.s.i. cold service.

Low in first cost, as well as in upkeep... and look at their wide utility—

Use Crane Clamp Gate Valves for steam; hot and cold water; crude, fuel, and lubricating oil; air, gas, and gasoline service.

Also in food and chemical process industries for caustic solutions, alkalies, corrosive chemicals, and gases.

You'll find Crane Clamp Gate Valves extra rugged, with a strong reinforced body and husky stem. Their compact design means a better fit for more places... a saving on piping in many cases. And because of the simplified clamp construction, these valves enjoy wide favor where frequent cleanout is essential. The bonnet assembly and wedge disc lift out easily—the body stays in the line. Reassembling is no problem—the bonnet joint makes up tight and stays tight.

Wide choice of regular patterns, all-iron or brass trimmed. On inside screw all-iron valves, an improved self-draining bonnet prevents entrapment of line fluids in the bonnet—protects the threads, keeps the stem working smoothly. Send for Folder AD 1667 or ask your Crane Representative for full detaiis.

THE BETTER QUALITY...BIGGER VALUE LINE...IN BRASS, STEEL, IRON

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois

Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

W. B. Zimmerman; vice-president, Chas. F. Goodenough; vice-president, Kenneth F. Geohegan; vice-president, J. E. Minch; treasurer, Eugene H. Hoffman; assistant treasurer, Herman Santen; secretary, Joseph A. Cobey; assistant secretary and controller, K. C. Koehler.

Quattrochi Joins Glassine

Samuel J. Quattrocchi, formerly chief chemist of Deerfield Glassine Co., has been appointed general superintendent of Glassine Paper Co. About the same time, Frank Potter became general manager of the same company.

Rayonier Establishes Scholarship Fund

The Rayonier Foundation, established by Rayonier, Inc., has provided a scholarship in the sum of $1000 for a senior in the University of Florida's College of Engineering. The check for $1000 was presented to the university's president, Dr. J. Hillis Miller, by Fred B. Doherty, resident manager of Rayonier at Fernandina Beach, and Walter Thad McDaniel, manager of industrial relations Southeastern operations, who is stationed at Jesup, Ga. Dean Joseph Weil, of the university's College of Engineering, said that a junior would be selected who would receive the scholarship next year.

OBITUARIES

Dr. Paul Schlosser, 59, research manager of Rayonier Incorporated, died on March 17.

Dr. Schlosser joined the research division of Rayonier at Shelton, Wash., in 1935. He has long been identified with the field of cellulose chemistry and rayon, and made important contributions to the successful development of wood cellulose as a basic chemical raw material. Dr. Schlosser studied under Prof. Emil Heuser at Darmstadt, Germany, before coming to this country. Subsequently, he worked with Glanzstoff in Germany and Woonsocket Rayon Co.

Arthur Mosby, long secretary of American Cotton Linter Assn., Memphis, Tenn., died in Memphis, March 13.

Earle H. Babb, 67, died unexpectedly on March 15 at his home in Westbrook, Maine. He worked for 30 years in the electrical department of the S. D. Warren Co.

NEW LITERATURE

BECCO High Density Bleaching Processes. (Bulletin 48) Describes processes and equipment for steeping, steam bleaching, pulp dryer steeping and other techniques; also contains various tables, 11 drawings and bibliography. Buffalo Electro-Chemical Co., Inc., Station B, Buffalo 7, N. Y.

B-I-F Industries Products Index. (Bulletin B-I-F 3) Contains illustrations and bulletin numbers of % Proportioneers, Inc. % chemical proportioning equipment, Omega volumetric and gravimetric feeders, Builders recording, indicating and controlling instruments; also list of agents and representatives. B-I-F Industries, P.O. Box 1342, Providence 1, R. I.

Elwell-Parker Electric Co. Trucks and Cranes. (Manual) Provides illustrations and description of entire line of platform and fork trucks; also floor cranes. Elwell-Parker Electric Co., 4205 St. Clair Avenue, Cleveland 3, Ohio.

Forty Years of Progress—The Growth of the Secondary Materials Industry. (Booklet) Highlights advancements of NAWMD and entire waste materials industry; marks the fortieth anniversary and depicts its parallel growth; also various portions of the industry. National Assn. of Waste Material Dealers, Inc., 271 Madison Avenue, New York 16, N. Y.

Improved Baldwin Assembly Multiple Width Rivited Roller Chains. (Bulletin 52-2) Contains illustrated sales copy showing how chain is made-up, not cut-up; construction charts; list prices; instructions on how to add life to chains. Chain Belt Co., Baldwin Duckworth Div., 1605 W. Bruce street, Springfield 2, Mass.

Koncentrik Stainless Steel Fittings. (Catalogue) Combines technical data and specifications on over 500 stainless steel fittings for tube sizes from ⅛" to 1". Special Screw Products Co., 5445 Dunham Road, Bedford, Ohio.

Ledeen Valves. (Bulletin 1000) Includes illustrations, operating and circuit diagrams, dimensions and weights on complete line, available in hand, foot, power and solenoid operated models. Ledeen Mfg. Co., 1600 So. San Pedro street, Los Angeles 15, Calif.

MH Electronik Controllers. (Catalogue 1530) Provides detailed specification and control action descriptions and ratings for electric and pneumatic types. Also presents engineering data on Electr-O-Line and Electr-O-Pulse electric control relays. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Avenues, Philadelphia 44, Pa.

MAMCO High Speed Sheet Units for Pulp, Paper and Board Mills and Printers and Converters. (Catalogue) Contains illustrated sales copy showing diversified usages for "Erie" and "Mamco" equipment. Maxson Automatic Machinery Co., 98 Granite street, Westerly, R. I.

Pangborn Self-Cleaning Cloth Screen Dust Collector. (Bulletin 915) Illustrates engineering features of new unit which uses principle of reverse air flow for continuous cleaning of cloth filters; also includes construction specifications; Pangborn Corp., Pangborn Boulevard, Hagerstown, Md.

R/M V-Belts. (Catalogue) Lists belts according to new industry-standard numbering system; also various types of machines alphabetically by company or trade name. Raybestos-Manhattan, Inc., Manhattan Rubber Div., 61 Willett street, Passaic, N. J.

How Ketchikan Progresses

According to L. P. Turcotte, president of Ketchikan Pulp Co., work on the company's mill in Alaska is progressing favorably. It is expected that pulp manufacturing operations will begin on schedule in mid 1954.

The Ketchikan project, as already reported, is a joint undertaking of Puget Sound Pulp & Timber Co. and American Viscose Corp. It will represent a total investment of about $46 million, consisting of up to $36 million senior capital provided by a group of large insurance companies, a subordinated three million dollar loan from American Viscose, and seven million dollars of common capital provided in equal amounts by Puget Pulp and American Viscose.

Receive Tree Farm Certificates

The Puget Pulp Tree Farm, Skagit Unit, was awarded the West Coast Tree Farm certificate at a recent meeting of the board of directors of the Industrial Forestry Assn., Portland, Ore. It is owned by the Puget Sound Pulp & Timber Co.

The new tree farm contains 33,680 acres of timber growing land. Three other Washington state tree farms were certificated at the recent meeting to bring the total acreage to 2,557,076.

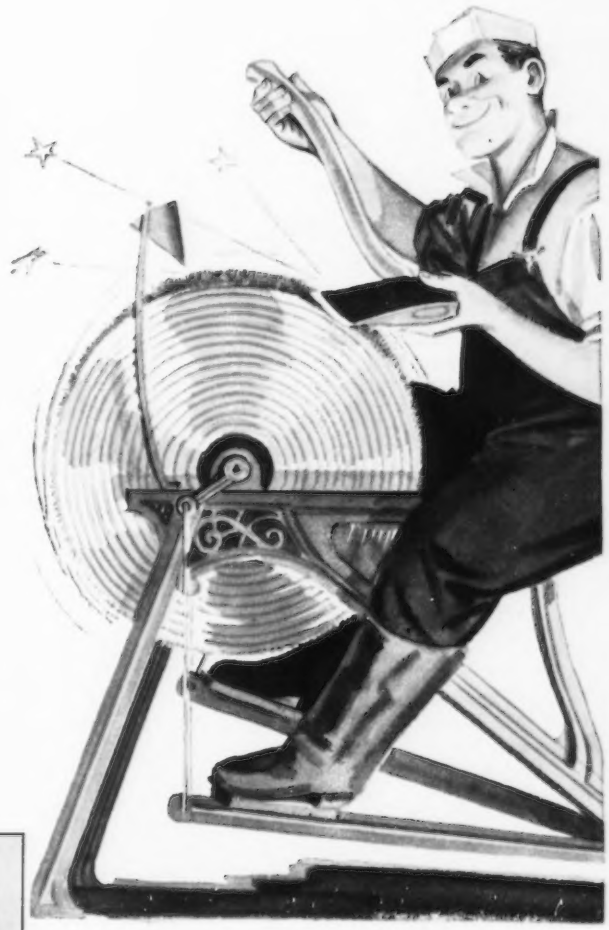
The NAP must stand the gaff...

WOOL vs. STEEL

They are running paper and board machines at such terrific speeds these days that conditioners and section boxes must be installed to extract clay, dirt and ash from the felts in one continuous operation. The shoes of the conditioners are everlastingly at work on the nap of the felts—steel against wool.

No other felts can stand this gaff like Hamilton Felts! Hamilton Felts have nap in plenty. It looks soft and it feels soft because it really *is* soft. But, because it is the best grade of wool the nap of Hamilton Felts lasts longer than the edges of the steel shoes.

Ask the Hamilton Felt man about this next time he calls at your mill.



Hamilton Felts

MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

NEWS OF ASSOCIATIONS

NPTA Holds Golden Jubilee Convention

Wednesday P.M., March 18, the National Paper Trade Assn. concluded a busy three-day meeting at the Waldorf-Astoria Hotel, New York City. The convention was a significant milestone in the association's history, being the fiftieth of such get-togethers. An unusually large attendance honored the occasion, and nearly 150 participating companies staged formal displays of their latest wrappings and fine papers.

New Officers

Among items of business at the annual meeting on the final afternoon was the election of the following new officers: President: Paul M. Jones, Stores & Bennet Co., Boston; Vice-President, Wrapping Div.: H. A. Hartinger, Paper Supply Co., Minneapolis; Vice-President, Fine Papers Div.: Robert S. Johnston, Old Dominion Paper Co., Norfolk, Va.; Treasurer: J. O. Buckley, Buckley, Dunton & Co., New York. Retiring president, Robert E. Knox of Chicago, received a framed scroll as a testament of valued service to the association.

Open Industry Meeting

General interest in the convention centered on the Tuesday morning Open Industry Meeting and the speeches by Sydney Ferguson, chairman, Mead Corp., who spoke as president of APPA; Thomas B. McCabe, president of Scott Paper Co.; and Hon. J. K. Javits, U. S. Representative from New York.

Mr. McCabe spoke on the subject "The Paper Industry — Its Heritage, Its Potentialities." In a review of pulp, paper, and paperboard progress in last half-century, he praised the industry's vigorous advance to sixth position among the industries of the nation. But, urging that past successes not be fondled but held simply as guides to the future, he proposed a basic formula for growth: "Production of highest quality products which must represent values sufficiently outstanding to win and hold an ever-growing number of consumers."

The keys to productive use of the formula are research and distribution, he said. Research into new products, into new uses for by-products, and into conservation of resources must be promoted; greater value from the costs of distribution must also be achieved.

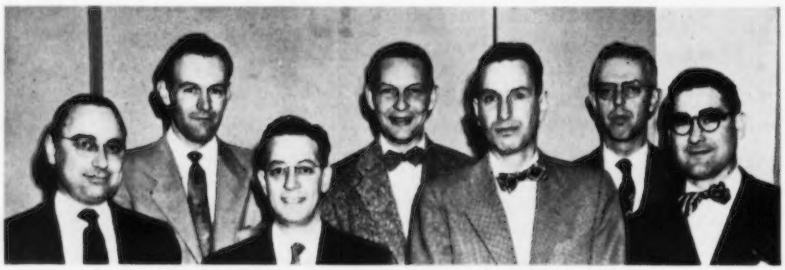
Mr. McCabe added further that the welfare of all industries may truly depend on how they behave during the next four years. He said:

"In a speech not too long ago, I tried to make it clear that after twenty years of banishment to the kitchen, American business and industry now has an opportunity with the new Administration in Washington to sit at the dining room table with labor, agriculture and the other elements of our economy. Gentlemen, may I offer this one warning. All we need do as business men in the next four years is suffer a lapse of our table manners and we'll be in the kitchen again for so long we'll be taken for the hired help. You probably feel as Scott Paper Co. feels — we were plenty tired of dishpan hands.

"Each industry must take it upon itself to prove its worth as an industrial neighbor. The Democratic donkey has the memory of the Republican elephant. He remembers years ago when we did not always behave as useful members of society.

"I feel strongly that we must forsake special privilege in dealing with the government and work effectively within the framework our fellow citizens have given us. Perhaps our first real test will come on the question of renewal of the Reciprocal Trade Agreements. There I think that we must forego purely selfish action for a policy that will benefit the country at large. The same will be true in the Administration's primary objective in attaining a balanced budget.

"If we can rise to the stature of economic statesmanship in this period when the leaders of business are on trial, then the public and the government will want us to continue to occupy a place at the head table."

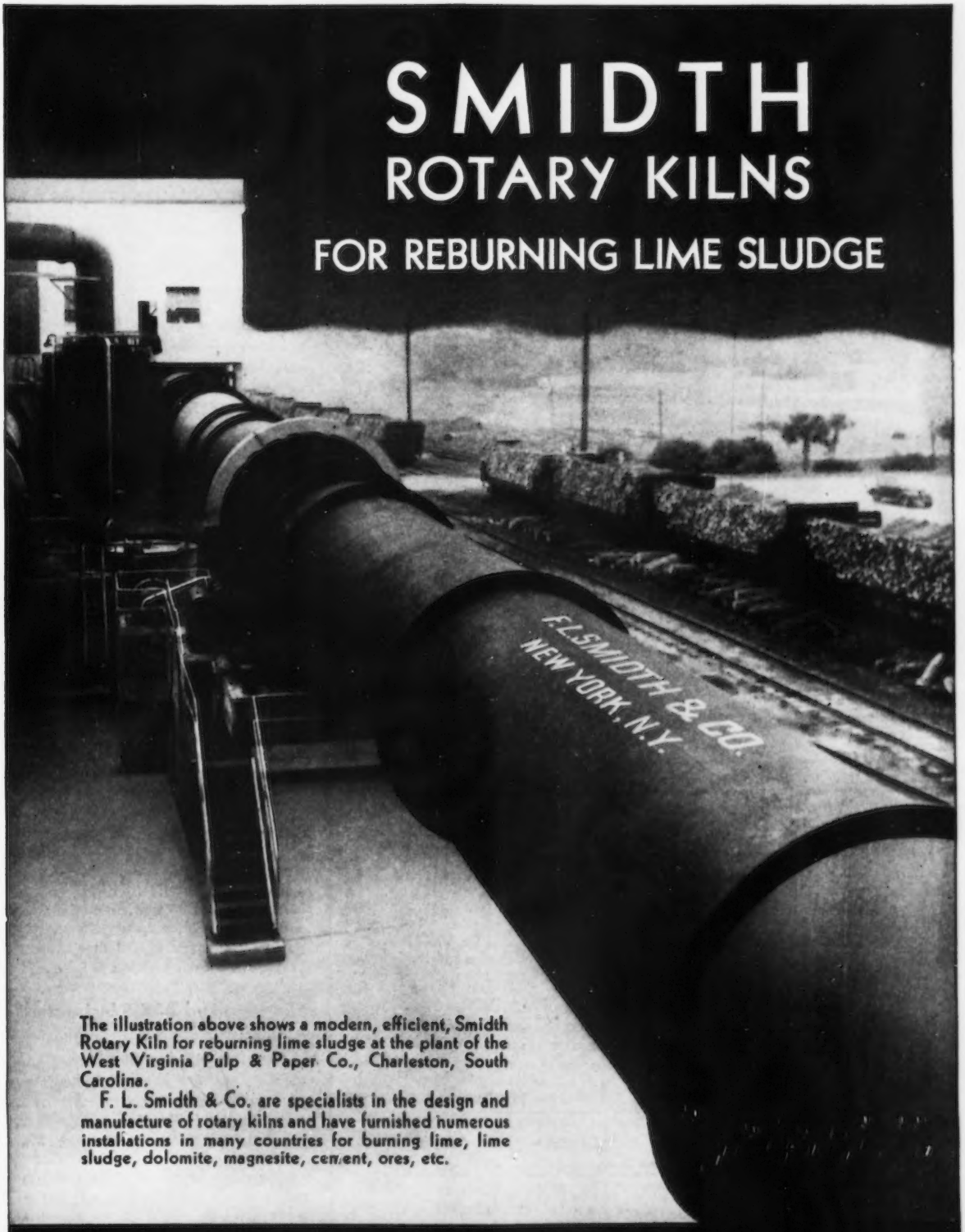


Attending Northern Empire TAPPI

Among officers and guests at March meeting of the Northern District, Watertown, N. Y. were: (L to R) R. A. Premo, Gould Paper, Chairman; G. V. Rittenhouse, Virginia Smelting; J. D. Parmele, St. Regis Paper, Vice-chairman; D. C. Mathers, Carthage Paper Makers; W. F. Luckenbach, Virginia Smelting, Main Speaker; J. H. Treadwell, Treadwell Supply, Treasurer; R. J. Murtaugh, St. Regis Paper, Secretary. Mr. Luckenbach spoke on the subject "Sell for America."

Speakers table at the February 26, 1953 meeting, Miami Valley Division of The American Pulp and Paper Mill Superintendents Assn. . . . L. to R.—D. W. Newell, Philip Carey Mfg. Co.; Harry Hadley, Gardner Board & Carton Co.; J. G. Purvis, Armco Steel Corp. (Guest Speaker); B. L. Merriss, Oxford Miami Paper Co. (Division Chairman); Ray Barton, Michigan Paper Co. (A trustee of the national association); Tany Agronin, Shartle Bros. Machine Co.; and George Lydick, Beckett Paper Co. . . . Mr. Purvis spoke on "Supervisory Training."

SMIDTH
ROTARY KILNS
FOR REBURNING LIME SLUDGE



The illustration above shows a modern, efficient, Smidth Rotary Kiln for reburning lime sludge at the plant of the West Virginia Pulp & Paper Co., Charleston, South Carolina.

F. L. Smidth & Co. are specialists in the design and manufacture of rotary kilns and have furnished numerous instaliations in many countries for burning lime, lime sludge, dolomite, magnesite, cement, ores, etc.

F. L. SMIDTH & CO.

11 WEST 42nd STREET • NEW YORK, N. Y.

LONDON • PARIS • COPENHAGEN • CANADA • BOMBAY

TAPPI Meeting Dates

DATE	SECTION	PLACE
April 2	Kalamazoo Valley	Hotel Harris Kalamazoo, Mich.
April 3	Central District Empire State	University Club, 431 E. Fayette St., Syracuse, N. Y.
April 9	Ohio	Trips to Bauer Bros. Springfield plant and Crowell-Collier Pub. Co.
April 9	Empire State Northern District	Hotel Woodruff Watertown, N. Y.
April 14	Empire State Metropolitan District	Fraunces Tavern New York, N. Y.
April 15	Lakes States	Elks Club Wisconsin Rapids, Wis.
April 16	Empire State Western District Ladies Night	Park Hotel, Lockport, N. Y.
April 16	Empire State Eastern District	Milfranks Restaurant Glens Falls, N. Y.
April 17	Lake Erie	Carter Hotel Cleveland, Ohio
April 23	Miami Valley Division	American Legion Hall Middletown, Ohio
May 21-23	Joint TAPPI-Superintendents Meeting, Pacific Section	Gearhart Hotel, Gearhart, Ore.
June 5	Miami Valley Division Central District	Spring Jamboree Piqua, Ohio
June 8-10	Empire State Annual Meeting	White Face Inn Lake Placid, N. Y.
June 19 and 20	New England and Maine-New Hampshire	Poland Spring House Poland Spring, Maine

Superintendents Meeting Dates

DATE	DIVISION	PLACE
April 16	Michigan	Hotel Harris Kalamazoo, Mich.
April 23	Miami Valley	American Legion Hall Middletown, Ohio
May 8-9	Northwestern	Del View Hotel Lake Delton, Wis.
May 15	Connecticut Valley	Roger Smith Hotel Holyoke, Mass.
May 15-16	Pennsylvania-New Jersey-Delaware	Stacy-Trent Hotel Trenton, N. J.
May 22-23	Pacific Coast Joint Meeting With TAPPI	Gearhart Hotel, Gearhart, Ore.
June 9-11	National	Atlanta-Biltmore Hotel Atlanta, Ga.
Sept. 17-19	New York-Canadian	The Alpine Inn St. Marguerite, Que.
Sept. 17-19	Northeastern	Poland Spring House Poland Spring, Maine
October 28-30	Southern and Southeastern (Joint Meeting)	Edgewater Gulf Hotel Edgewater Park Mississippi

The address by Representative Jacob K. Javits also dealt with the ways in which industry in general could best conduct itself for its own best interest and that of the nation. He advocated that industry take an active part in the development and implementation of U. S. foreign policy through economic and technical assistance to foreign industry and the re-ordering of U. S. production to allow reduction of tariff barriers, thereby closing the dollar gap which is troubling the free world.

Congressman Javits further advocated industry's support to broader worker ownership of U. S. business, to the protection of civil rights, and to aids for educational and charitable institutions by contributions under the allowable 5 percent deductions from income taxes.

Future of Northeastern Paper Mills Discussed Before Eastern Empire TAPPI

At the March 19 meeting of Eastern District of Empire State TAPPI, held at Milfranks Restaurant, Glens Falls, a talk entitled "More New Patterns" was delivered by Gordon B. Shattuck, manager of supply, Strathmore Paper Co., West Springfield, Mass.

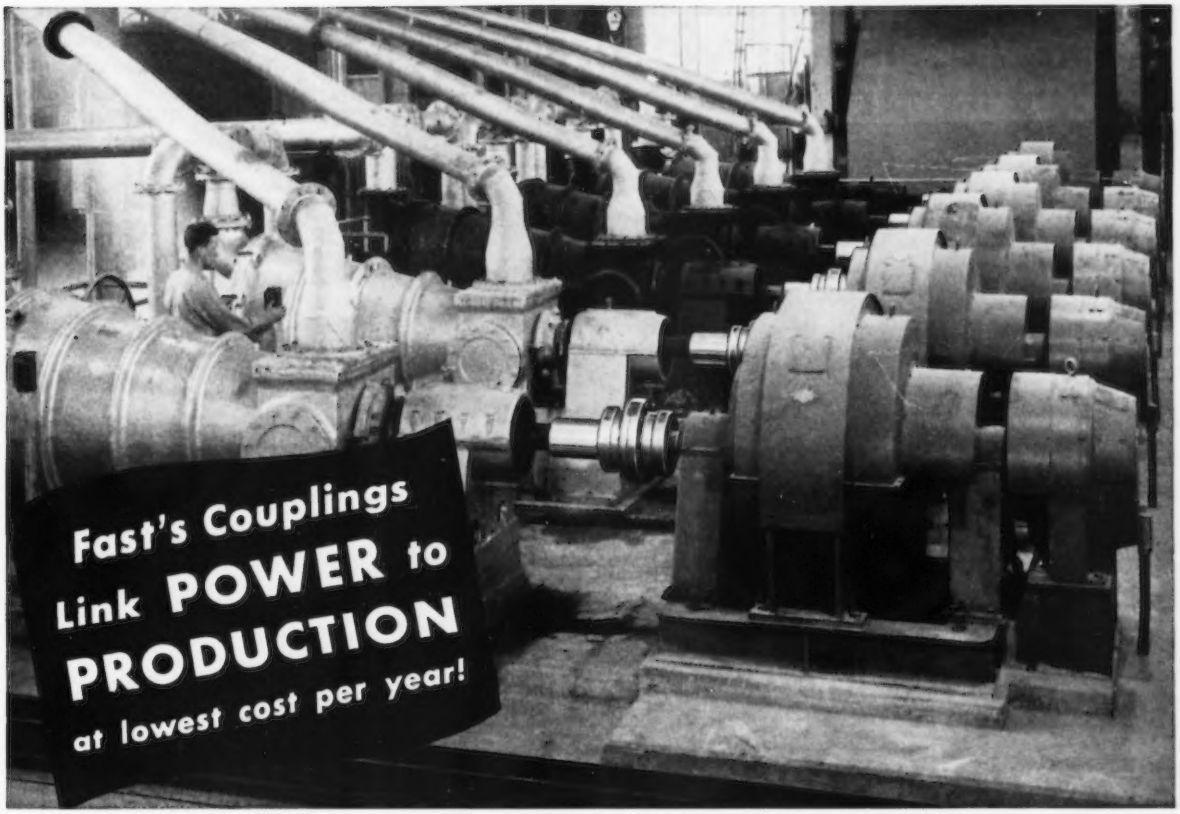
He reviewed past declines in paper production among the small mills in northeastern United States and the strong competition growing up in the large southern mills. However, it was his sincere opinion that the death of northern production would be the fault of no one but the mills involved. In a hopeful note he declared, "The solutions will be varied. But I suggest that part at least of the over-all solution must be: that we must diversify our products, and go farther into the specialty paper field. Further than that, we must develop new papers that will be so unique and useful that they will create their own demand."

New England TAPPI Instructed In Quality Control

E. C. Harrington, Monsanto Chemical Co., outlined the important phases of quality control to a meeting of the New England Tappi Section, March 20, Hotel Roger Smith, Holyoke, Mass.

The talk dealt with the application of greater control to plant procedure, the role of quality control statistics and their correlation with research and development programs.

A. E. Bachmann, general manager, Missisquoi Corp., Sheldon Springs, Vt., was scheduled to contribute to the discussion but sent a letter regretting his inability to attend and listing the 14 points he felt were vital to efficient quality control.



FAST'S Jordan-type Couplings usually outlast the equipment they connect!

THE first Fast's Jordan-type Coupling was installed in 1922. The original Jordan machine was worn out long ago . . . but the Fast's Coupling is *still in service.* And similar stories are true of *every* type of Fast's, throughout *all* industry!

When you specify Fast's, Koppers Engineering Service assures you the *right* coupling for *every* job . . . protecting your paper mill drives against costly and needless coupling failures. And this dependable, trouble-free service pays off in *lowest coupling cost per year!*

For detailed information, photographs and specifications, write today for your free Fast's catalog to: KOPPERS COMPANY, INC., *Fast's Coupling Dept.,* 273 Scott St., Baltimore 3, Md.

Here's How FAST'S Save You Money

Free Service—Koppers free engineering service assures you the right coupling for the job.

Rugged Construction—Fast's still maintains its original design, without basic change or sacrifice in size or materials. Result: freedom from expensive coupling failures.

Lowest Cost per Year—Fast's Couplings usually outlast equipment they connect. Their cost may be spread over many years!

KOPPERS®

FAST'S
THE ORIGINAL
GEAR-TYPE
Couplings

INDUSTRY'S STANDARD FOR 32 YEARS

KOPPERS COMPANY, INC., *Fast's Coupling Dept.*
273 Scott St., Baltimore 3, Md.

Gentlemen: Send me Fast's Catalog which gives detailed descriptions, engineering drawings, capacity tables and photographs.

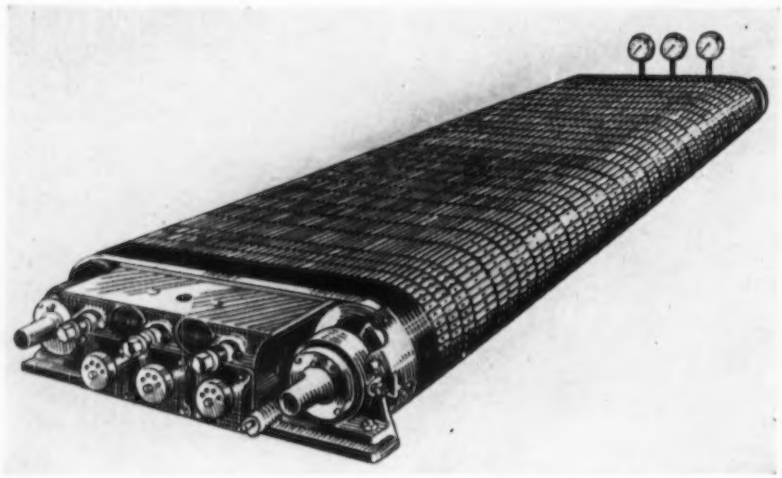
Name _____

Company _____

Address _____

City _____ *Zone* *State* _____

NEW EQUIPMENT AND SUPPLIES

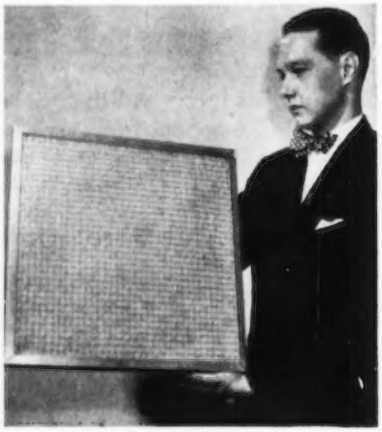


British Suction Unit Now Being Produced in U. S.

Developed in England by W. P. Evans & Son, Ltd., and now available from their U.S. plant in Nashua, N.H., the Rotabelt suction unit is designed for removal of water from paper machine clothing and is said to effect considerable increases in the life of wires and felts and marked reductions in power requirements.

The unit consists of a central casting usually of three separate suction compartments. On either side of this casting are mounted rolls which carry an endless rubber belt. The belt has multiple, overlapping grooves with a hole at the bottom of each. These holes run over grooves in the suction compartments, and through this combination suction is created beneath a wire or felt much like that of a flat box. The rubber belt is lubricated on its inside face with a fresh water shower. As the wire or felt is pulled onto the belt by suction, it provides the power to drive the unit. For special applications, the unit can be furnished in one or two compartment construction. Current operating limitation is maximum speed of 1000 feet per minute, but the makers state that experiments are now under way to advance the maximum limit.

Besides savings in clothing life and power, a further advantage of the device is claimed; namely, that any desired vacuum can be used without danger to felts and wires, thus permitting machine speed-ups. The manufacturer, in a report on two American installations, claims that in one case, on a fourdrinier with a 113 inch wire, the first wire run with the suction unit lasted four times longer than the 1952 average for the machine and 2.9 times longer than the 1952 maximum. A second installation on a 164 inch machine with sectional drive is said to have produced an average power reduction of 45 percent, based on comparative readings of couch power.

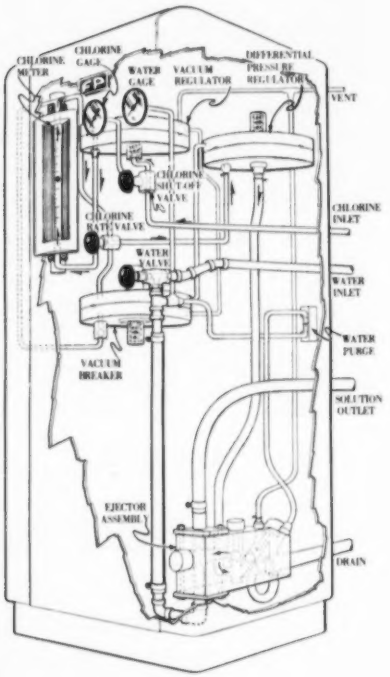


Washable Air Filter

Full scale production of a washable, plastic air filter, developed by the Goodyear Tire & Rubber Co., Dept. 722, Mechanical Goods, Akron 16, Ohio, that traps and holds the fine pollen, soot, and dust particles by static electricity is now underway. Known as Pliotron, the device utilizes the inherent conductive characteristic of Polyethylene film, and is said to remove more fine dirt from forced-air heating and air conditioning systems than ordinary filters.

The filtering agent in the new product contains a lifelong electrostatic charge. When air is forced through the plastic material it takes on an additional charge. This electric charge attracts dust particles in the manner a magnet attracts metals.

It is stated that filters can be installed without modification of present forced-air systems. It is cleaned by gently rinsing in clear water and may be replaced without drying. It is produced in four sizes: 16 x 20 x 1 inch, 16 x 25 x 1 inch, 20 x 20 x 1 inch, and 20 x 25 x 1 inch.

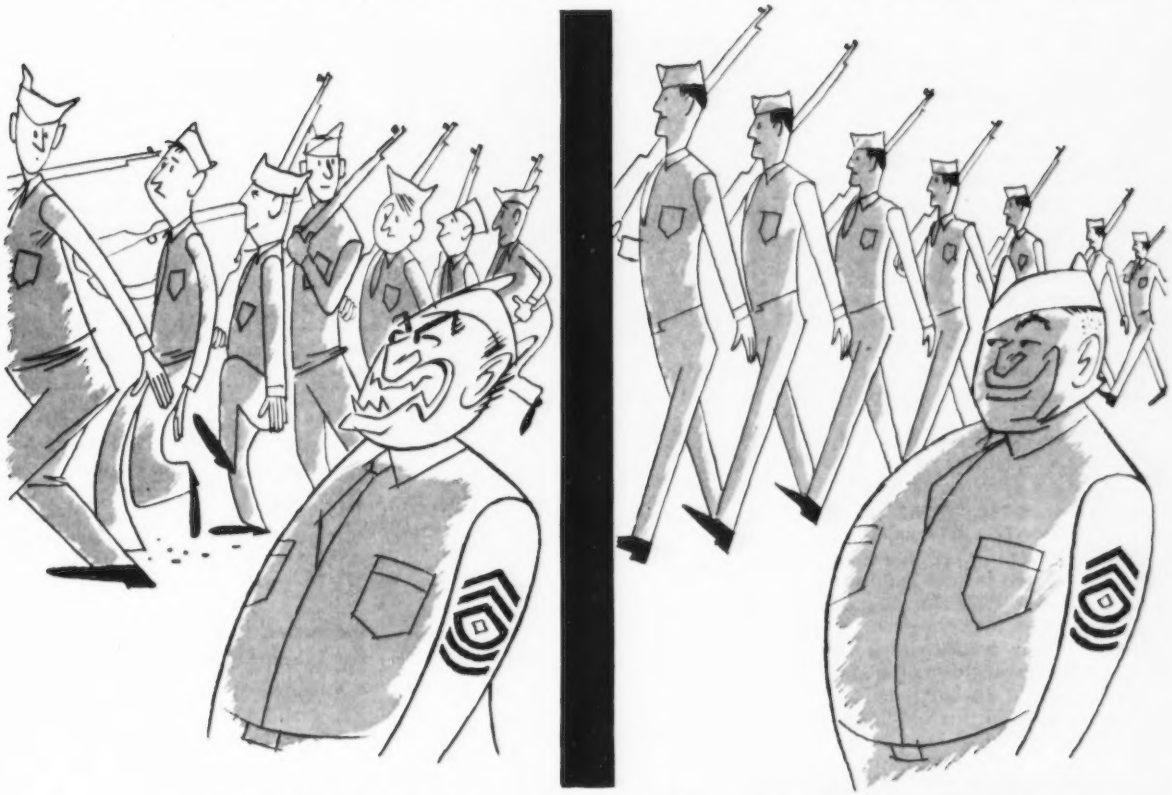


Corrosion-Resistant Chlorine Dispenser

A vacuum-type solution-feed chlorine dispenser, including new corrosion-resistant materials claimed to be unaffected by either dry or wet chlorine gas is now offered by Fischer & Porter Co., 10 Jacksonville Rd., Hatboro, Pa., with either manual or automatic proportioning control in capacity ranges up to 1000 PPD maximum.

Large diaphragm areas in the regulators and minimum friction in the few moving parts are said to assure constant chlorine flow rate in the manual-reset model and accurate ratioing in the automatic proportioning dispenser. The chlorine flow rate is changed by a valve setting while the vacuum is held constant. The dispenser may be adapted for remote setting with an air-operated diaphragm motor valve in accordance with standard industrial control methods.

Uniformity makes the difference . . .



. . . in "paper-rated" cotton linters

Paper-Rated cotton linters are specially selected on a basis of cleanliness, staple length, color, and character to meet your needs in paper-making.

But, in addition, you need *uniformity*, shipment after shipment. To assure this uniformity Railway Supply maintains a full-time staff of seven government-licensed graders in the linter producing areas. These cotton experts carefully test and grade every lot before releasing it for shipment.

This careful checking enables Railway to assure you uniformity in bale after bale of Paper-Rated linters.

Write for the full story on Paper-Rated Cotton Linters, prepared exclusively for the paper industry by Railway Supply.

Railway SUPPLY AND MANUFACTURING CO.

335 West Fifth Street, Cincinnati 1, Ohio

MEMPHIS • DALLAS • LOS ANGELES • ATLANTA • CHARLOTTE • NEW YORK • CHICAGO

Although in normal operation the chlorine remains completely dry until the regulated flow of gas enters the water stream at the injector, after which the chlorine-water solution immediately leaves the system, this chlorine dispenser is designed to be unaffected should water vapor enter the chlorine lines. Materials used to prevent internal corrosion include Uscolite, Teflon, Kel-F, Hastelloy "C," Monel, silver and tantalum.

When the unit is in operation, chlorine gas enters the dispenser at its vapor pressure and flows through the shut-off valve to the vacuum regulator where gas pressure is reduced to a partial vacuum of about 20-in. water column. The gas then passes through a wide-range flow meter to the chlorine rate valve.

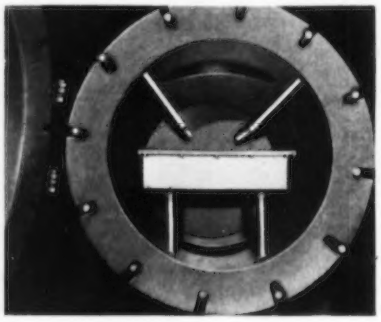
Among the safety measures incorporated in the dispenser is the vacuum breaker which prevents flooding of the system with water during shutdown. The ejector, vacuum regulator, and vacuum breaker are all connected to the gas vent. The vacuum breaker, vacuum regulator, and differential pressure regulator have interchangeable components. The maximum overall dimensions of the housing are 20 in. (width at rear), 57 in. (height) and 15 in. (depth).

Spray-On Dye For Detecting Metal Flaws

A kit containing Spotcheck, a dye penetrant for locating cracks in any solid material, is now available from Magnaflux Corp., 5900 Northwest Highway, Chicago 31, Ill.

Features of the kit include can-sealing of messy constituents for spray application and specially designed carrying case.

The dye penetrant is pressure sprayed on the clean surface to be tested. Then a cleaner is sprayed on the surface, and removed by a quick wipe. An even coat of white developer is brushed on, and inspection follows in a few seconds. Cracks show up as bright red lines, and pores or leaks in tanks show as bright red spots. The dye is labeled non-toxic.



Magnetic Trap For Vertical Installation

A new magnetic Vertical Down-Pressure Trap for use in slurry lines and designed particularly for the paper industry has been developed by the Eriez Manufacturing Co., Erie, Pa. It is primarily used to protect pumps and refiners and can be installed in a section of vertical down-pipe, thus requiring little space. This position takes advantage of the force of gravity which drives the flow of material containing tramp iron directly onto the magnet's face.

The unit consists of a cylindrical housing, furnished by customer, with an inlet at top and an outlet at the bottom. It is suggested that the cylinder be fabricated from 24" diameter pipe and should include baffles and magnet supports.

This unit is furnished with stainless steel angle guides welded in place. In operation, the material flows directly down onto the middle of the magnet face plate, dividing in two directions to flow off the sides of the plate into the outlet pipe. The metal impurities fall by gravity and velocity into the intense magnetic field. The depth of flow over the magnet is restricted by the baffles to 3½". A pressure-sealed door on the side can be opened to slide the magnet out for removal of the collected tramp iron. These traps range in size to accommodate volumes ranging from 1500 g.p.m. to 5000 g.p.m.

According to the makers, the trap can be used in place of, or in addition to, magnetic pulleys to clean wood chips ahead of digesters before tramp iron can damage wood hogs or valves; also in regulators and head boxes to stop tramp iron in slurry lines.

Synthetic Size For Alkaline Operation

Said to be a new concept in synthetic sizing agents which makes possible the manufacture of papers previously considered impossible, Cyron Size has recently been introduced by American Cyanamid Co., Paper Chemicals Dept., 30 Rockefeller Plaza, New York 20, N. Y. The material is offered as capable of fixing in the paper under alkaline conditions.

It is reported that the material produces good results in both alkaline and acid stocks and is effective as a beater additive when water, high ink, acid, and alkaline resistance specifications must be met. It is further claimed that this size not only eliminates the need for making paper under acid conditions but reduces curl in the finished sheet.

The material, with which no rosin, wax or alum is said to be required, may be applied to the surfaces of rosin sized papers for added effect. It is prepared for mill use by dissolving in hot water and adding to the slush stock or to surface sizing equipment.

Detailed technical data is given in Technical Bulletin No. 29, which may be obtained from the manufacturer.

Increased Retirement Benefits for Champion Employees

Effective March 1, 1953, Champion Paper and Fibre Co.'s retirement income benefits have been increased substantially at no additional cost to its employes. At the same time, the company-wide Retirement Income Plan is being further liberalized to make the program available to a larger number of eligible employes.

Directly benefited by the announcement are some 4500 Champion employes now enrolled under the organization's Retirement Income Plan, as well as an estimated 350 retired employes. Another group of younger Champion men and women are now eligible to participate immediately.

As of March 1, Champion increased its retirement income benefits by 25 percent. The company assumed the entire expense of the increase with no additional contributions from employes in the plan. As of the same date, employes who have been associated with Champion for a period of three years became eligible for the plan without regard to age. The annual cost of the changes will be about $700,000.

Previously, employes were not eligible to join Champion's Retirement Income Plan until they had reached the age of 30 years and had been with the company for at least five years. Thus, the way is now open for about one thousand Champion employes at Hamilton, Ohio; Canton, N. C.; Pasadena, Texas, and in widely scattered areas of allied operations to participate in 1953.

PRICES

MARKET WOOD PULP

First Quarter Contract Prices, Per Short Air-Dry Ton

	Delivered Basis		Varying Freight Allowances		
	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 87.50†	‡$60.00/ 90.00	$75.00/ 80.00§	$75.00/ — §	$80.00/ —
Sulfate, Bleached	140.00/147.50	145.00/155.00	140.00/142.50§		
Semi-bleached Sulfate	140.00/ —		135.00/ —		
Sulfate, Unbl.	95.00/125.00	100.00/125.00	§100.00/105.00§	$105.00/135.00	100.00/ — §
Sulfite, Blchd.	140.00/ —	140.00/145.00	§137.50/140.00	140.00/ —	140.00/145.00
Sulfite, Unblchd.	125.00/132.50	130.00/135.00	115.00/ — §	120.00/125.00	115.00/ — §
Sulfite, Unbl'd (glassine)	127.00/ —		119.00/ — §		
Soda, Blchd.	140.00/ —	140.00/ —		Delivered Basis	
Sulfite Screenings	45.00/ —				
Stand. News, Sideruns	92.50/ —	80.00/ 85.00			

† Midwestern Markets. ‡ F.o.b. Shipping Point. § On Dock Atlantic Ports.

RAG MARKET

New Domestic Cotton Cuttings

Delivered Mill Basis

No. 1 White Shirts	$14.50/$15.00
No. 1 Unblchd. Muslins	16.00/ 16.50
Blchd. & Unblchd. Underwears	16.00/ 16.50
Blchd. Canton Flannels	14.00/ 14.50
No. 1 Light Silesias	10.00/ 10.50
No. 1 Light Prints	7.00/ 7.25
No. 1 Blue Overalls	9.50/ 10.00
Suntan Khakis	7.75/ 8.25
Fancy Shirts	6.75/ 7.00
Mixed Khakis	4.75/ 5.00
Cottonades	4.50/ 4.75
No. 1 Washables	4.00/ 4.25

Old Domestic Cotton Rags

(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$3.50/$4.00
Cotton Pants & Overalls	2.75/ 3.00
Thirds and Blues, Repacked	2.00/ 2.25
No. 1 Roofing Rags	1.00/ 1.05
No. 2 Roofing Rags	.90/ .95

COTTON LINTERS

Memphis Market

F.o.b. Oilmills

	March 17 cents per lb.
Grade 1	n.a.
2	13.50/ 12.00
3 1st cut—felting	11.50/ 10.00
4	9.00/ 7.00
5	6.50/ 5.50
6 * 2nd cut—chemical	5.00/ 5.00
7 *	5.00/ 5.00

* Based on 73% cellulose.

Bagging

(Prices to Dealers, F.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$4.75/$5.00
Heavy Wool Tares	4.75/ 5.00
Foreign Scrap Burlap	3.75/ 4.00
Austr. Wool Pouches	5.00/ 5.50
Domestic Manila Rope	6.25/ 6.75
No. 1 Sisal Strings	5.00/ 5.25

WASTE PAPER MARKET

Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal. See TRENDS.

	New York March 23	Philadelphia March 10	Boston March 23	Chicago March 3
No. 1 Mixed Paper	$9.00/ 10.00	$8.00/ 11.00	$9.00/ 10.00	$8.00/ —
No. 1 News	16.00/ —	11.00/ 15.00	15.00/ 18.00	17.00/ —
Mill Wrappers	14.00/ 15.00	8.00/ 10.00	12.00/ 15.00	11.00/ —
Old Corrugated	21.00/ 22.00	15.00/ 17.00	18.50/ 19.00	20.00/ —
Double Kraft Ld. Corr. Cuts	35.00/ 42.00	35.00/ 42.00	35.00/ 42.50	40.00/ 42.00
100% Kraft Corr. Cuts	45.00/ 55.00	45.00/ 55.00	45.00/ 55.00	55.00/ —
Triple Sorted Br. Kraft	40.00/ 45.00	30.00/ 35.00	35.00/ 45.00	35.00/ —
New Br. Kraft Env. Cuts	65.00/ 75.00	55.00/ 65.00	55.00/ 70.00	55.00/ —
New Br. Kraft Bag Cuts	55.00/ 60.00	45.00/ 55.00	45.00/ 60.00	60.00/ —
No. 1 Gdwd. Shvs.	20.00/ 30.00	15.00/ 20.00	25.00/ 35.00	27.00/ —
White Newsblanks	55.00/ 70.00	60.00/ 70.00	50.00/ 70.00	45.00/ —
Soft Wht. Shvs. 1 Cut	80.00/ 85.00	65.00/ 80.00	80.00/ 90.00	70.00/ —
Hd. Wht. Shvs.	90.00/ 95.00	85.00/100.00	90.00/ 95.00	85.00/ —
Hd. Wht. Env. Cuts	115.00/125.00	100.00/125.00	105.00/125.00	100.00/ —
Col. Tab. Cards	50.00/ 60.00	50.00/ 55.00	40.00/ 50.00	40.00/ —
Manila Tab. Cards	70.00/ 75.00	70.00/ 85.00	70.00/ 80.00	50.00/ —
Mixed Ledger	40.00/ 45.00	35.00/ 45.00	38.00/ 45.00	45.00/ —
White Ledger	55.00/ 65.00	55.00/ 60.00	50.00/ 60.00	60.00/ —
No. 1 Book & Mag.†	16.00/ 18.00	13.00/ 15.00	12.00/ 16.00	15.00/ —
No. 1 Rep'd. Hvy. Books‡	25.00/ 35.00	18.00/ 22.50	25.00/ 35.00	27.50/ —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. § Deld.

MATERIALS

Aluminum sulfate:		
cml. bags, wks.	cwt.	1.65
iron-free, c.l.	cwt.	3.25
Casein, acid prec.:		
dom. sh. pt. c.l.	lb.	.28 / .40
imp. ex. dock	lb.	.16 / .24
Caustic soda:		
c.l. wks. solid, 76% cwt.		3.35
flak. & grd. 400 lb. drums		3.75
liquid 50% tanks		2.55
liquid 70% tanks		2.65
China clay:		
dom. air-float, c.l. wks.	ton	10.00
water-washed, lump, filler		11.00
coating		17.60 /30.50
imported, ex. whse.	short ton	16.00 /29.50
Chlorine:		
single-unit tanks, works	cwt.	2.70
multi-unit	cwt.	3.20 / 4.40
Formaldehyde:		
USP, inh. dms. c.l. wks.	lb.	.0666/ —
l.c.l., E. wks.		.071 / —
Fuel oil:		
Bunker C, No. 6 hvy. tanks, N.Y. harbor	bbl.	1.90 / 2.00
light, tanks, refinery	bbl.	2.15 / 2.25
Lime:		
hydrated, bags, wks.	tons	13.50 /15.50
Gum rosin:		
K, M, N drms, c.l. Savan	cwt.	7.38 / 7.77
Rosin size:		
70%, gum & pale grds., tank cars, south, sh. pt.	cwt.	6.50 / 6.60
Salt cake:		
dom. bulk, c.l. wks.	ton	17.00
wks. frt. all	ton	20.00 /22.00
Soda ash:		
light, 58%, bags, wks.		1.50
bulk	cwt.	1.20
Sodium silicate, 40° Be.:		
tank-cars, wks.	cwt.	.90 / —
drums, wks.	cwt.	1.25 / 1.80
42° Be. WW. tank-cars, wks.	cwt.	1.45 / —
drms, wks.	cwt.	1.80 / 2.35
Sodium peroxide:		
dms. c.l. E. of Miss.	lb.	.186
l.c.l. do.	lb.	.196 / —
Soybean, protein:		
chem. isol, wks., c.l., bags	lb.	.23½/ .24¼
Sulphuric acid:		
60° Be. cbys. c.l. wks.	cwt.	1.75 / —
l.c.l. wks.	cwt.	2.05 / 2.85
tankcars, wks.		16.30 / —
Sulphur:		
crude, c.l. mines, contract,	long ton	21.00 /22.00
f.o.b. vessels Gulf		25.00 /27.50
Sulphur dioxide:		
liquid, coml. cyl. wks.	lb.	.09
multi-unit cars	lb.	.0535
Starches:		
pearl corn, bags, c.l. prod. plant		6.39 / —
white, dextrines, c.l. do.	cwt.	7.78 / —
potato, Idaho, c.l. wks.	cwt.	8.50 / —
potato, Maine f.o.b. wks.	cwt.	7.35 / —
potato, imported O.D.	bags	8.00 / 8.20
Talc:		
domestic, sacks, c.l. wks.	ton	25.00 /30.00
Titanium dioxide:		
anastase, c.l. deld., bags	lb.	.21 / .21½
l.c.l. deld.	lb.	.22 / .22½
rutile, c.l. deld.	lb.	.23 / .23½
l.c.l. deld.	lb.	.24 / .24½

NEWS OF SUPPLIERS

REICHHOLD CHEMICALS, INC., has set up a manufacturing division at Ballardvale, Mass., to produce its extensive line of synthetic resins and basic industrial chemicals used by the region's textile, paper, and other industries.

ATLAS MINERAL PRODUCTS CO., Mertztown, Pa., has established a course of instruction on plastic construction materials. All corrosion engineers are invited to attend without tuition charges and regardless of company affiliation.

The subject matter will be based primarily on a reference book authored by Drs. Raymond B. Seymour, Robert H. Steiner and George Gabriel. This will be supplemented by practical applications. A full week's course and a three day course have been established for corrosion engineers and maintenance personnel respectively.

Attendance will be limited to male industrial engineers and maintenance personnel who require a knowledge of corrosion resistant coatings, linings, jointing materials, fabricated plastics and caulking materials in their work.

Those desiring to attend the courses of instruction during the Summer of 1953 should make application to Atlas Vice-President J. A. Snook at least three weeks prior to the period in which they would like to attend. It is suggested that applicants list three different weeks stating the order of preference. Both the short and long sessions will be repeated throughout the summer.

WATSON-STILLMAN CO., Division of H. K. Porter Co., Inc., Roselle, N. J., has appointed Albert B. Diss vice-president and general manager. Mr. Diss in his new position will be in complete charge of all manufacturing and sales operations. Until promotion to his present position he had been vice-president in charge of manufacturing.

MERRITT CHAPMAN AND SCOTT CORP. was host recently at a breakfast for representatives of the business press. The occasion was an introduction tour of the company's new general offices on the second floor of 260 Madison Ave., N. Y.

BLAW-KNOX CO., Pittsburgh, Pa., has appointed William Rogers to the new post of general sales manager, effective April 1.

BRISTOL CO., Waterbury, Conn., makers of controlling, recording and telemetering equipment, has made Harry E. Beame vice-president of sales.

NATIONAL ANILINE DIV., Allied Chemical & Dye Corp., has promoted J. F. Wright, formerly New England representative to assistant manager of its General Office Paper Division, 40 Rector street, New York 6, N. Y.

HOOKER ELECTROCHEMICAL CO., Tacoma, Wash., has appointed Harry W. Bryson, Jr., sales service representative. His activities cover service on caustic soda, chlorine and ammonia. His territory includes the Pacific Northwest states, British Columbia and Alaska. He has been employed by Hooker since 1950 in the process study group.

KELCO CO., of New York, Chicago and Los Angeles, has named Alfred D. Bonanno, of Andover, Mass., a technical sales representative servicing the paper manufacturing industry in the eastern division.

Mr. Bonanno has been associated with the Champion-International Co., Lawrence, Mass., where for the past four years he has held the position of superintendent of the coating division.

MISCO
STAINLESS STEEL CASTINGS
FOR ALL EQUIPMENT EXPOSED TO CORROSION BY SULPHITE ACIDS OR OTHER CORROSIVE AGENTS
MICHIGAN STEEL CASTING CO.
DETROIT 7, MICHIGAN

ALVIN H. JOHNSON & CO.
INCORPORATED
415 LEXINGTON AVENUE
NEW YORK (17), N. Y.
Consulting Engineers to The Pulp and Paper Industry Since 1929

NORTON
Grinding Wheels
Pulpstones • Refractories
Grinding Machines
Porous Mediums
Non-slip Tiles &
Aggregates
Norbide Products
NORTON COMPANY
WORCESTER, MASS.

Egan
Designers and Builders of
TREATERS
AIR DRYERS
LAMINATORS
COATERS
and
Special Machinery for Paper Converting and Plastic Film Machinery
Write for pamphlets
FRANK W. EGAN & COMPANY
BOUND BROOK, NEW JERSEY

RAG CUTTERS
FOR ROOFING AND FINE WRITING PAPER MILLS
Capacities from one to five tons an hour.
TAYLOR-STILES Company
CUTTING MACHINES & KNIVES
10 Bridge Street, Riegelsville, N. J.

Restigouche
BLEACHED SULPHITE PULP
for the manufacture of cellophane, rayon and paper products
RESTIGOUCHE COMPANY, Ltd.
Campbellton, N. B., Canada

He is a member of the American Pulp and Paper Mills Assn. and the Technical Assn. of the Paper and Pulp Industry.

NATIONAL ALUMINATE CORP. of Chicago recently promoted Herman R. Powers, Dr. David G. Braithwaite and Gage Averill each to the post of assistant vice-president.

National Aluminate is the manufacturer of Nalco water treatment chemicals, petroleum catalysts, fuel oil treatments, and paper process chemicals.

Mr. Powers has been Nalco field manager of Industrial Sales and Service since June 1951. Prior to that he was district manager in the Pittsburgh area, where he accumulated a broad background on water treatment in the industrial power field.

Dr. Braithwaite, Catalyst Division production manager, has been in the Nalco organization close to eleven years.

Gage Averill joined the Catalyst Division as sales manager in November 1949; prior to which he managed catalyst sales for American Cyanamid.

Maine P. & P. School Photographed for T.V.

The University of Maine's program in pulp and paper technology which is designed to prepare young men to take positions of responsibility in the industry will be shown on a national television program early in April. TV's *Omnibus* program is scheduled to show the highlights of Maine's course in pulp and paper on April 5.

A crew of four men from RKO-Pathe visited the campus March 16 through 18 to prepare the television program. Dudley Hale, who writes the script for the program, was at the university previously to work out preliminary plans for the show. The sponsors of the Omnibus Program are financing the preparation of the TV show.

Extend Closing Date of Bolton Award Contest

The closing date for receipt of entries in the Sixth Bolton Award Contest, which was previously set for March 31, has been extended for an additional thirty days. The new closing date will be April 30, 1953.

Papers from pulp and paper mill employees in North America on the subject, "The Obligations of a Company to Its Employees" will be accepted if mailed before midnight April 30 to the Secretary-treasurer, American Pulp & Paper Mill Superintendents Assn., 327 S. LaSalle street, Chicago, Ill.

ONLY NASH VACUUM PUMPS HAVE ALL THESE FEATURES
One Moving Element. Non-pulsating Vacuum. No Internal Parts In Wearing Contact. No Internal Lubrication. Handles Liquid With Air. No Expert Attendance. Constant Efficiency. Low Maintenance Cost.
Plus—
NASH ENGINEERING COMPANY
409 WILSON AVE., SO. NORWALK, CONN

WORLD NEWS AND MARKETS

Australian and New Zealand Notes

Easing of import controls as from April 1 has been announced by the Federal Government, and this is expected to bring in an additional £50 million worth of merchandise in the next twelve months. Changed from administrative control to "license freely" are pulp for paper manufacture and fruit wrapping paper.

Some indications of present cuts may be gathered from the latest South Australian statistics. In the five months ended November 30, 1951, imports of paper, paper pulp, etc., from overseas were valued at £1,111,808, but in the same period to November 30, 1952, such imports had dropped to £502,839.

* * * *

Application 149,055 has been lodged by R. H. McKee for an Australian patent for a process for producing a paper pulp: "characterized therein that lignin-containing cellulosic materials are heat-digested with a hydrotropic solution to produce a crude fiber pulp and a lignin solution and that the lignin is directly precipitated from its solution on to the fiber pulp by dilution with water or aqueous liquids or by water washing."

* * * *

A third unit is expected to be in production by July or August, says a spokesman for Thomas Owen & Co. (Australia) Ltd., adding that last year's loss of £15,481 can be regarded as the cost of initiating one of the products which the plant is to make. "The parchmentizing machine was in part-time operation for three months only," he said.

* * * *

Sulphates Ltd. reports a marked expansion in demand for its paper alum, and plans to increase Australian paper and board output indicate the need for the company to expand, its directors say.

* * * *

New Zealand Forest Products Ltd. has passed its most difficult pioneering stage, according to Chairman David Henry, and it can consolidate in the near future. In ten years the company has earned one million pounds profit after paying an equal sum in taxation, and providing £700,000 depreciation on plant and premises. Long-term markets have been found for substantial quantities of pulp, paper and timber. Latest profit is at a peak—£275,038, and paid-up capital now exceeds £6 million. Mr. Henry adds that no conflict is likely between his company and the State-sponsored Tasman Pulp & Paper Co., which will exploit the State forests at Kaingaroa, as it has always been considered that the chief purpose of the Kaingaroa forests would be for the production of newsprint. New Zealand Forest Products is not making newsprint, and the Government has assured the company that it will not compete with it in markets for pulp.

* * * *

Shortages of paper in past months led to the introduction of plastic wrappings for bread and meat and other foodstuffs, and in many centers these wrappings are still being used. At least one of the major Australian paper manufacturers, however, is advertising widely in an effort to get new and clean paper used as wrappings instead of used paper or old plastic wrappings.

* * * *

M. J. Foley, executive vice-president of the Powell River Paper Co., has been visiting Australia on business.

* * * *

J. G. Wilson has been appointed deputy managing director of Australian Paper Manufacturers Ltd. He is a director of the company and also of the holding company the Australasian Paper & Pulp Co. Ltd.

Customs Court Rules on Paper Imports

The United States Customs Court has decided an important test case involving the dutiable value of Finnish wrapping papers, chiefly kraft, holding that the paper was undervalued by an attempt to deduct Finnish inland freight from the dutiable value, according to a report issued by Warren B. Bullock, Manager of the Import Committee of the American Paper Industry. The issue dates back to 1948, and the decision will apply to over 200 importations in which the claims of importers for lower duties had been rejected by Customs officials and appealed to the Court.

Among the protests filed with the United States Customs Court are five covering shipments of decorative paper for box covering classified duty as articles of coated paper at 5 cents per pound and 10 percent, but claimed by importers to be dutiable as photographs at 12½ percent because the design was produced from plates made by photography.

National Gypsum's Export Sales Dept. in New York

National Gypsum Co. has transferred its Export Sales Department to New York City. To be located in the Graybar Building on Lexington Avenue where National Gypsum's New York District Sales Office is already established, the department is expected to be in full operation by April 1.

William Croscup has been appointed Manager of Export Sales. He will direct all export activities except the Canadian contractual sales which will still be transacted at the home office in Buffalo.

ENGLISH ECCO CLAYS TRADE MARK CLAYS

UNIFORM SUPERIOR DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

Training Movie On Safe Truck Operation

A new training and safety film for industrial truck operators has been produced by the Clark Equipment Co. The new 30 minute sound movie, titled "Safety Saves," was filmed at on-the-job factory and warehouse locations. It dramatically illustrates the "do's and don'ts" of safe driving, and shows the cause of most truck accidents and how to avoid them. It is said to be the only training film of its kind in existence.

The "villain" of "Safety Saves" is Willie the Cowboy, a lad who drives has fork truck like a hot-rod. Along with horrible examples of how not to handle a fork truck, the movie shows the safe, correct method. Besides fork truck operation, "Safety Saves" contains instructions for operators of towing tractors and hand trucks.

The movie is available on a loan basis from Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

Longview and Rayonier Win Safety Awards

Longview Fibre Co., Longview, Wash., and the Hoquiam, Wash., plant of Rayonier, Inc., earned the two top awards when the seventh annual joint labor and management safety conference for Washington state convened in Tacoma, March 12 and 13.

A trophy was presented to the Hoquiam plant for the best safety record for 1952. The plant's records showed an accident rate of only 3.53 per million man hours worked. The Longview Fibre plant earned its trophy for the best safety record over a five year period, only 3.28 disabling accidents per million man hours.

More than 225 representatives of labor and industry met for a full two day session, representing 20 Washington state mills. Presiding was Jack F. Robertson, safety supervisor, Crown Zellerbach Corp., Camas, Wash. The conference co-chairmen were James Sherman, vice-president of the International Brotherhood of Pulp, Sulphite, and Paper Mill Workers, and I. M. Gilmore, general safety supervisor, Rayonier, Inc. Mr. Gilmore called the meeting to order. The opening addresses were delivered by John Teevin, international representative of the International Brotherhood of Paper Makers, and H. W. Morgan, manager of the pulp division of the Weyerhaeuser Timbre Co.

The progress report for 1952 was given by Oscar Robertson, international representative of the IBPM. Otto R. Hartwig, general safety director, Crown Zellerbach Corp., presented statistics to show what accidents cost the injured individual.

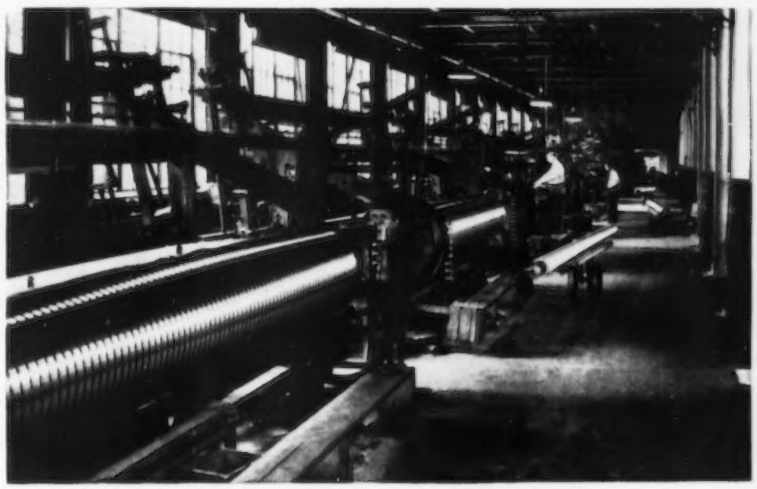
The feminine viewpoint of safety was presented when the ladies took over and presided at a special afternoon panel session.

The value of the Washington conference was pointed out. Since 1946, when the organization began, there has been approximately 800 per cent decrease in accidents in the industry in the state of Washington. It was reported that Washington state accident rates for pulp and paper mills are now 7.5 disabling accidents per million man hours as compared to a 14.8 rate for the U. S.

Sponsors of the conference are the Pacific Coast Assn. of Pulp & Paper Manufacturers, the International Brotherhood of Pulp, Sulphite and Paper Mill Workers (A. F. of L.) and the International Brotherhood of Paper Makers (A. F. of L.)

Crown-Zellerbach Donates Land

Five acres of land have been deeded by Crown-Zellerbach without cost to the city of Lebanon, Ore. as a site for the construction of a municipal sanitary sewage disposal plant. Construction of the $166 thousand plant will begin this spring.



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WIDEST
Fourdrinier Wires

The fact that Lindsay is now weaving the widest Fourdrinier wires in this country is an indication of the extensive resources, facilities and experience at your command and that of the industry to further the art of paper making.

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FOR PAPER MILLS

It will speed the reply to your inquiry to mention Paper Trade Journal.

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Process Studies, Design, Specifications and Engineering Supervision
PULP AND PAPER MILLS
Steam, Hydraulic and Electrical Engineering Reports, Consultation and Valuations
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MERKOR
Non-Returnable, Durable standard mill core.
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Returnable and Non-Returnable extra strong mill core for regular and special needs.
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NEW YORK OFFICE—500 5th AVE.

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1953	Feb. 14 95.3	Feb. 21 94.5	Feb. 28 95.0	Mar. 7 93.5r	Mar. 14* 96.3
1952	Feb. 16 97.9	Feb. 23 96.8	Mar. 1 97.0	Mar. 8 96.9	Mar. 15 94.5

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1952	97.1	97.8	95.1	90.4	87.9	97.6	73.3	86.1	81.7	90.7	90.5	85.6‡	89.6‡
1953	95.0‡	94.9‡											

COMPARATIVE YEARLY SUMMARIES

	1946	1947	1948	1949	1950	1951	1952	1953
Year to Date	98.1	104.9	100.7	93.1	94.7	100.9	97.6	94.9
Year Average	96.9	101.7	92.1	83.7	95.8	98.0	89.6‡	

* Weekly Capacity base increased by 1,512 tons.
‡ Preliminary.
r Revised.

PAPERBOARD OPERATING RATIOS †

1953	Feb. 14 95	Feb. 21 94	Feb. 28 95	Mar. 7 96	Mar. 14 94
1952	Feb. 16 87	Feb. 23 87	Mar. 1 83	Mar. 8 86	Mar. 15 85

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1952	81	86	85	82	82	82	71	89	88	96	96	85	85
1953	91	95											

All of the above data is based on tonnage reported to American Paper and Pulp Association Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: In the above tables *all* the ratios shown are on the basis of a normal 6 and 7 day capacity.

† Per cents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

Genetics Conference to Meet in Wisconsin

The Lake States Forest Experiment Station is sponsoring a Forest Genetics Conference, March 31-April 1, at Trees for Tomorrow Camp, Eagle River, Wis. Any one interested in forest genetics research is invited to attend.

The program will feature discussions and reports by a number of experts on their various special activities.

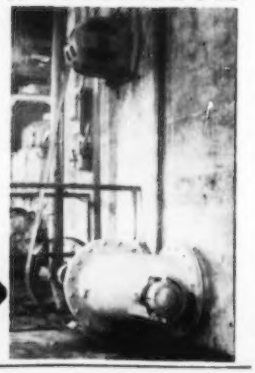
March 31, 9:00 a.m. Session—Forest Genetics in the Lake States: Past and Present; 2:45 p.m. Session — Forest Genetics in Other Regions; 8:00 p.m. Session — Forest Genetics Research in Europe.

April 1, 8:30 a.m. Session — Forest Genetics Problems Needing Study; 1:30 a.m. Session—Future Research in the Lake States.

Management Institute Cites 21 Pulp and Paper Companies

Among its 1953 listing of excellently managed companies, as observed during 1952, the American Institute of Management has cited for distinction 21 companies engaged wholly or in part in the production of pulp, paper or paperboard. A total of 330 companies representing a variety of industries make up the list. These corporations were selected on the basis of comparative audits of over 3000 American concerns.

The honored pulp and paper companies were: Armstrong Cork Co., Brown Co., Champion Paper & Fibre Co., Congoleum-Nairn, Inc., Container Corp. of America, Crown-Zellerbach, Great Northern Paper Co., Hinde & Dauch Paper Co., International Paper Co., Johns-Manville Corp., Kimberly-Clark Corp., Marathon Corp., Masonite Corp., National Gypsum Co., Northern Paper Mills, Ruberoid Co., St. Regis Paper Co., Scott Paper Co., U. S. Gypsum Co., West Virginia Pulp & Paper Co., Weyerhaeuser Timber Co.

POWER SAVINGS with APMEW AGITATOR
Usually Repay Investment TWO TIMES *EVERY YEAR!*
Q— How?
A— By giving unique agitation for the more uniform consistency that assures BETTER, MORE SALABLE PAPER —*ask us to prove it.*
APMEW AGITATOR GIVING EXCELLENT AGITATION AND MIXING ON LARGE CHEST 40 FT. LONG BY 20 FT. WIDE BY 20 FT. DEEP

APMEW, INC., P. O. Box 1, Glens Falls, N.Y.

PAPER TRADE JOURNAL

CLEARING HOUSE

PAPER TRADE JOURNAL

RATES FOR ADVERTISING
(PAYABLE IN ADVANCE)

$.75 cents per line (6 words to line) minimum charge $3.75
—Additional charge of 70 cents if box number is used

Situation wanted advertisements can be repeated for ½ rate

Space in this section can also be purchased at $5.00 per column inch—(1" x 2¼")

Address replies to advertisements appearing under Box Number in care of **PAPER TRADE JOURNAL, 15 West 47th Street, New York 36, N. Y.**

HELP WANTED

MEN WANTED — POSITIONS OPEN

We can place—Managers, day and night supts. and asst. supts. lightweight specialty papers and carbonizing tissues; supt. kraft liner; and bleached food specialty board mills; office mgr.; sales mgr. for board mill in Germany; sales mgr. pressure sensitive tape.

Chemists, chem. engineers and laboratory men and technical directors for mills also for selling and demonstrating; salesman to sell belting to New England mills; Cylinder machine foreman; finishing foremen sulphite bond papers and board; salesman for fine printing papers for Boston area.

Master mechanics; project, plant and electrical engineers, designers and draftsmen; instrument mechanic; beater engineers; converting foreman; super calender operators; air-dryer operator; machine tenders and back tenders. Die room foreman to take charge retail box die making operations; pulp-paper technologist $600-$700 month.

LIST YOUR APPLICATION WITH US.
IT WILL BE CONFIDENTIAL
CHARLES P. RAYMOND SERVICE, INC.
Phone: Liberty 2-6547
294 Washington St., Boston 8, Mass.
M-27

Experienced man for Cost Accounting, Production Scheduling and Inventory Control for Fine Paper Specialty Mill in Mid-West. Applicant must have aspirations to assume duties and responsibilities of Assistant General Manager. Replies to Box #53-115 care Paper Trade Journal. M-27

RESEARCH ENGINEER

Medium sized manufacturing company in central New Jersey is looking for a Graduate Engineer with five or more years experience to work on design and development of new and existing operational equipment.

This is an excellent opportunity to grow with an established concern.

Address Box 53-112, care Paper Trade Journal. A-3

HELP WANTED

Wanted two backtenders, one third hand. Machine running 800 feet. Manufacturing light weight chip.

Call W. A. Crawford collect 3-3441
PRAIRIE STATE PAPER MILLS
JOLIET, ILLINOIS TF

YOUNG CHEMIST for research. Good education essential. 1 to 2 years paper experience. Exceptional opportunity, progressive New England Mill. Our personnel know of opening. Reply fully, including salary requirements, references, to Box 53-94 care Paper Trade Journal. A-3

WANTED—Superintendent for a small Folding Boxboard Paper Mill, located in upstate New York. Must know his business from Bending Chip to White Patent Coated. Attractive salary and complete charge. Address Box 53-118 care Paper Trade Journal. TF

HELP WANTED

WANTED—Converting Foreman and Supercalender Operator for Paper Mill located on west coast. Please submit complete history of your background and experience. Reply to Box 53-116 care Paper Trade Journal. A-10

CHEMIST or Assistant wanted for Groundwood and Newsprint Mill in Eastern Quebec. Reply giving experience, references, salary required, etc. Address Box 53-117 care Paper Trade Journal. A-10

WANTED—Machine Tender for folding Boxboard. Must be A-1 with the intention of advancement to a Tour Boss or Superintendent. Daily production average 20 tons per day. Attractive salary. Address Box 53-119 care Paper Trade Journal. TF

PAPER SALESMAN wanted to take over established territory in New York City and Northern New Jersey. Experience in specialties required but not necessary. Excellent opportunity for man who has personality and ability to maintain mill contacts and an established business. Address Box 53-120 care Paper Trade Journal. A-3

WORKING MASTER MECHANIC to take complete charge of maintenance, repairs and installation in a one machine board mill, in middlewest. Submit full details in reply. Replies will be held confidential. Address Box 53-121 care Paper Trade Journal. M-27

SITUATIONS WANTED

ENGINEER

Twenty years varied experience in all phases of pulp and paper mill engineering, maintenance, operation, and design. Have practical paper making experience with excellent record for increasing production. Now employed as plant engineer and want position with future.
S.B. degree in engineering. Licensed professional engineer New York State. Address Box 52-484 Care of Paper Trade Journal, 15 West 47th Street, New York 19, N. Y. TF

PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon Laboratory Coating and Treating and Flat Ream Measuring and Converting Machines. New improvement. THE MAYER MACHINE COMPANY, INC., 1313 Buffalo Road, Rochester, 11, N. Y. TF

SUPERINTENDENT — Twenty six years of practical experience manufacturing high grade folding boxboard, frozen food cartons, other sanitary food packages from sulphite, sulphate, groundwood, old paper stock. Aggressive, capable man. Excellent references. Address Box 53-4 care Paper Trade Journal. M-27

DEINKING, BLEACHING, WASTE PAPER PROBLEMS—Expert consulting services, laboratory facilities, available. Operational problems of existing plants; design of new plants; engineering; construction. In strictest confidence. Address Box 53-19 care Paper Trade Journal TF

PLANT MANAGER—Paper and Board and their conversion. Highly successful record in organization; administration; development; labor relations; and high level production. Presently employed. Seeks challenging opportunity. Address Box 53-80 care Paper Trade Journal. A-10

16 YEARS EXPERIENCE in manufacturing supercalendering and converting of various grades of coated and uncoated papers. Cost minded, good reference, married. Desire position as Assistant Superintendent or finishing department supervisor. Address Box 53-111 care Paper Trade Journal. M-27

SITUATIONS WANTED

MECHANICAL-INDUSTRIAL ENGINEER, 31. Paper, packaging, chemical background. Experienced manufacturing and cost controls, product development, handling-equipment design, maintenance, sales. BSME, BA Chemistry, veteran. Address Box 53-122 care Paper Trade Journal. M-27

FOR SALE

FOR SALE

42" Camachine No. 6
48" Kidder model CH Slitter
75" Moore & White Upright 2-drum Rewinder.
100" Dillon Sheeter, with Back-stand
68" Oswego mill type Power Cutter.
Back-stands, made to order—any size.
THOMAS W. HALL COMPANY Inc
120 West 42nd St., New York 18
(Plant at Stamford, Conn.) TF

FOR SALE

400#—650° B&W Stirling 4 drum, Class XXII—22 Boiler with superheater and 6 retort underfeed stoker. Built in 1928.
400#—650° B&W Stirling 4 drum, Class XXII—33 Boiler with superheater and 9 retort underfeed stoker. Built in 1933.
1500 KW, G.E. 325# pressure, extraction condensing turbine, extraction @ 35#, 1500 sq. ft. condenser. Built in 1927.
Address inquiries to Box 53-105 care Paper Trade Journal.
M-27

FOR SALE

Clark-Aiken Paper Cutter—124" width. Equipped with two rolls and a set of take-off tapes, one set of air cylinders on Pinch Roll, 2 HP Motor. May be examined at:

MONUMENT MILLS, INC.
Housatonic, Mass M-27

A.C. MOTORS (3Ph. 60Cy.)

HP	MAKE	TYPE	SPD.	WDG.
400	Al. Ch.		514	S.R.
400	G.E.	MT	450	S.R.
300	G.E.	IM	450	S.R.
200	West.	CW	600	S.R.
150	G.E.	ATI	600	Syn.
125	West.		277	Syn.
100	G.E.	IM	450	S.R.
100	West.		900	Syn.
100	G.E.	IK	1750	S.R.
100	West.	CS	1200	S.C.
75	West.	CS	900	S.C.
60	West.	CW	575	S.R.
30	West.	CS	1750	S.C.

Many Smaller A.C. Motors in Stock

TRANSFORMERS (1Ph. 60Cy.)

KBA	MAKE	PRI.	SEC.
1—3000(3Ph)	G.E.	25000	2200
3—200	Al. Ch.	22000	2200
3—100	West.	13200	2300
3—75	Kuhlman	13200	110-220
5—25	West.	6600	110-220

D.C. MOTORS: M G SETS, ETC.

MOORHEAD ELECT. MACH'Y. CO.
P.O. Box 7981L — Pittsburgh 16, Pa.
TF

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CABLE ADDRESS: JACKROSS

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265 PASSAIC STREET
NEWARK 4, N. J.

CONVERTING
PAPER MAKING EQUIPMENT

NEW, USED, REBUILT
PAPER AND PULP MACHINERY

AGITATOR DRIVES
2—Cleveland enclosed—3 h.p. Ratio 24 to 1.
1—Foote Bros. enclosed—15 h.p. Ratio 33 to 1

AIR HOIST
1—5-ton Ingersoll-Rand with Trolley.

BALERS
1—Economy Baler—20¼ x 24 x 49.
1—Economy Baler—60 x 32 x 96, with 5 h.p. motor.

BEATER FILLING
1—New 54" Beater Filling with ⅜" bars, woods and bed plate.

BLOWERS
1—Sturtevant Monogram Fan, Ball bearing. Size 7.
1—Sturtevant Multivane Fan, Ball bearing. Size 6.

CALENDER ROLLS
16—Chilled Iron Rolls—Assorted sizes.

CALENDER STACKS
1—Farrel Birmingham, 5 roll, 108" Calender with doctors, 2 rolls bored for steam.
1—Black Clawson 90" 7 roll with 2 spare rolls.

"CYCLAFINER"
1—Shartle "Cyclafiner" with coupling.

CYLINDER MOLDS
1—134" face x 36" diameter, with stainless steel shafts.
1—77" face x 48" dia.—Stainless Steel Shaft.

DAMPENER
1—Valley Micromist Unit for water finish on paper—120" deckle.

DRIVES
1—#3 Reeves anti-friction bearing.
1—Beloit enclosed drive right angle, ratio 3 to 1, with couplings and pulleys.
1—Falk enclosed drive, 100 H.P., ratio 5 to 1.
1—Link-Belt 40 h.p., ratio 2.2-1, 500 r.p.m.—227 r.p.m.
1—Cleveland enclosed drive right angle, 7 h.p., 24½ to 1 ratio, 1750 r.p.m.
3—#2 Reeves enclosed vertical drives, ratio 3 to 1.

DRYERS
17—160" face x 48" diameter.
2—160" face x 36" diameter.
34—143" face x 48" diameter with frames, gears, bearings, steam joints, etc.
7—137" face x 48" diameter with frames, gears, bearings, steam joints, etc.
13—132" face x 48" diameter with frames, gears, bearings, steam joints, etc.
1—130" face x 48" diameter.
19—127" face x 42" diameter.
1—126" face x 48" diameter.
2—124" face x 48" diameter.
1—117" face x 48" diameter.
2—116" face x 48" diameter.
1—116" face x 36" diameter, with gears and bearings.
1—110" face x 42" diameter, with bearings.
1—104" face x 36" diameter.
2—103" face x 48" diameter.
1—102" face x 48" diameter, with bearings.
15—86" face x 36" diameter, with frames, gears and bearings.
19—88" face x 36" diameter, with frames, gears and bearings.
1—77" face x 48" diameter—with gear.
39—46" face x 48" diameter, with gears, bearings and steam joints.
3—42" face x 36" diameter, with frames, gears and bearings.

EXTRACTOR ROLLS
1—Downingtown Extractor Roll—128" face x 24" diameter. Anti-friction bearings.

FILTERS
1—Oliver Vacuum Filter, 10' face x 5' 3" diameter. Steel vat.

FLAT SCREENS
3—8 plate Sandy Hill Roller Shoe with scrapers.
3—Bagley & Sewall 8 plate, with scrapers and plates.

FOURDRINIER WIRES
3—New Lindsay 76" x 47 ft. 10"—60 mesh.

HYDRAULIC PRESS
1—Thorpe 200 ton. Steam platens, 40" x 40" with pump.

JORDANS
1—#6 Miami, for motor drive.
1—Jones Majestic Stainless Steel Filling.
2—E. D. Jones Pony, 3/16" stainless steel fillings—banded plugs, spare new fillings.
1—Smith & Winchester Standard with granite fillings.

KAMYR WET END
1—Kamyr Wet End. Cylinder 59" diameter x 80" face. Steel vat—rubber couches—spare rolls and spare parts.

KNIFE GRINDER
1—100 Hanchett Knife Grinder with motor.

LABORATORY EQUIPMENT
1—Watson Stillman Hydraulic Press 12" x 12" platens, 5½" daylight opening. Built in Pump.
1—New Sperry 12" Filter Press—20 plate.

LAMINATOR
1—Black-Clawson 48" Foil Laminator, complete, including Hamblet Sheeter. Used 1 month.

MOTORS
1—Allis Chalmers 30 h.p., 440 v., 660 r.p.m.
1—General Electric—25 h.p.—230 volts—3 ph —60 cycle—3/0 900 r.p.m.
25 other 440 v. motors from 2 h.p. to 15 h.p.
1—Electric Machine Company 200 h.p. synchronous—2200 V., 3 phase, 60 cycle, 1200 r.p.m. Direct connected to exciter and starter panel.

PULP EQUIPMENT
2—AIMEW Ball Bearing Pulp Screens—30 ton capacity—outward flow.
1—D. J. Murray 10' x 25' Barking Drum.

PULPERS
2—#2 Lannoye.

PUMPS
1—New Worthington—bronze filled, 10,000 g.p.m., 35' head, with extended base for motor—spare new impeller.
44—Centrifugal Pumps, open & closed impellers. Direct connected or Belt Driven. Extended base for motor. Assorted capacities and heads. Most used less than one year.

REELS
1—Pusey & Jones 162" drum reel, complete with unwind stand and water cooled brake.
1—98" face x 24" diameter Drum Reel. Will rewind 40".

ROLL GRINDER
1—Lobdell 18 Roll Grinder handles 26" maximum diameter rolls.

ROLLS—PRESS, COUCH, etc.
32—Press rolls, brass and rubber covered.
14—Couch rolls, brass and rubber covered.
250—Brass and steel carrying rolls.

ROTARY SCREENS
2—#2 Bird—Copper vat.

SAVEALL
1—Bird #5 with enclosed drive and 3 h.p. motor.

SCREW PRESSES
1—Valley Voith Screw Press, size 2.
1—Valley Voith Screw Press—enclosed drive.

SHEETERS
1—Hamblet 124" Duplex Sheeter with maxim layboy—8 roll backstand—motor and starter.
1—Moore & White Simplex 114" Sheeter with slitters—counter. Maxson layboy overlapping delivery. 8 roll backstand, motor and starter.
1—Finley 42", single knife.

SHREDDERS
1—American 37" Hammermill, anti-friction bearing.
1—Jeffrey, 26½" knives, 7 knife rotor, 6 knife bed plate. Ball bearing.

SLICE
1—Beloit 132" adjustable slice, complete, including stands. Slice is of all bronze construction. Operated 1000 feet per minute.

SLITTERS AND WINDERS
1—Beloit 125" Paper Machine Slitter and Rewinder—42" rewind.
1—Cameron 44", Model 9-S.
1—Hudson Sharp 60" Wax Paper Automatic Slitter and Rewinder.

SMOOTHING PRESSES
2—New Farrel Birmingham 108" face x 24" diameter. Rubber covered, with ball bearings and enclosed drives.

STEAM TURBINES
1—De Laval 225 h.p. Initial pressure 140 p.s.i. Exhaust pressure 35 p.s.i. Complete with gear reducer.
1—De Laval Variable Speed—325 h.p. at 135 gauge and 30 p.s.i. exhaust. Complete with gear reducer.

STOCK PUMPS
1—Shartle 10 x 20 Single Plunger Pump.
2—Beloit 8 x 10 Triplex.
1—Triplex—8 x 10. Used less than 1 year.
2—Shartle Agi-flo, 13" suction, 14" and 4" discharge. Anti-friction bearings.
1—Beloit 10 x 20 Triplex.
1—Moore & White 10 x 16 Triplex.
1—Moore & White 8 x 8 Triplex.

SUCTION BOXES
6—Brass Suction Boxes, 156" x 4" opening.

SUCTION COUCH ROLLS
1—Millspaugh 36" diameter x 234" drilled face with enclosed drive, water cooled bearings, 12" suction boxes.
1—Millspaugh 156" drilled face x 22" diameter Suction Couch. Operated at 1000 ft. per minute.
1—Sandusky Suction Couch, 25" diameter x 122" drilled face.

SUCTION FELT ROLL
1—New Downingtown 186" drilled face x 16" diameter, with anti friction bearings and stands.

SUCTION PRESS ROLLS
1—Sandusky 84" drilled face x 22" diameter, rebuilt.
1—Sandusky Suction Press 22" diameter x 122" drilled face, with anti friction bearings and frames.

SUPERCALENDER STACK
1—Norwood 60" 10 roll, complete with motors and controls.

THICKENER
1—IMPCO 5 ft. diameter Vacuum Thickener, 80" face with steel spare couches. Used 3 years.

TOILET TISSUE PERFORATOR
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Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
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General Dyestuff Corp.
Nopco Chemical Co.

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Blaw Knox Company
Chicago Bridge & Iron Co.
Lukenweld
Pandia, Inc.
Pusey & Jones Corp.

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General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Black Clawson Company
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Lodding Engineering Corp.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
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Bird Machine Company
Lodding Engrg. Corp.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Westinghouse Electric Corp.

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Beloit Iron Works
Biggs Boiler Works Co.
Black Clawson Company
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Jackson & Church Co.
Lukenweld
The Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Red-Ray Mfg. Co., Inc.
Rice Barton Corporation
Ross Paper Machy. Co.
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Shartle Brothers Machine Co.
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Manchester Machine Co.

DRILLED SUCTION DRUM ROLLS
Downingtown Mfg. Co.
Manchester Machine Co.

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Beloit Iron Works
Bird Machine Co.
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Jeffrey Mfg. Co.
General Electric Company
Gibbs-Brower Company, Inc.
Link Belt Co.
Manchester Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
Rice Barton Corporation
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Valley Iron Works Co.

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Downingtown Mfg. Co.
Manchester Machine Co.
Rice Barton Corporation

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Midwest Fulton Mch. Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

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M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Waldron, John, Corp.

DUSTING BRUSHES
M. W. Jenkins Sons, Inc.

DYESTUFFS
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Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The

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Testing Machines, Inc.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

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Research Corporation

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Clark-Aiken Co.
Egan, Frank W., & Co.
Paper Converting Machine Co.
John Waldron Corp.

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Gibbs-Brower Company, Inc.
Holyoke Machine Co.
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John Waldron Corp.

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Raymond, Chas. P., Service, Inc.

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Nopco Chemical Co.
Wyandotte Chemicals Corp.

ENZYMES
Vanderbilt Co., R. T.

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Goslin-Birmingham Mfg. Co., Inc.
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Swenson Evaporator Co., Div. of Whiting Corp.
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Roots-Connersville Div.
Ross Engineering Co., J. O.
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Shuler & Benninghofen
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General Dyestuff Corp.
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Rice Barton Corporation
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The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

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Wyandotte Chemicals Corp., Michigan Alkali Div.

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By having a gauge near each end of the calender, non-uniform material produced by "cocked" rolls has been eliminated. The lower picture shows the circular recorders mounted above the Tracerlab gauge consoles. Located 50' from the gauge heads they are adjacent to the operators. Product changes can be noted instantly and the necessary calender adjustments made.

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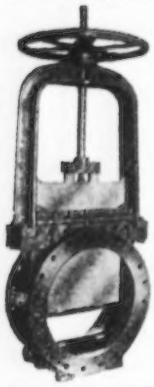

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The photo of 24" Fig. 241 I. B. B. M. valve while illustrating the gate bottom wedge system for forced gate seating and "GUILLOTINE" edge for shearing fibre at seat also shows the packing box and yoke as separate units. Both adjustable.

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Aktivin Division, Heyden Chemical Corp.
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The Bagley & Sewall Company
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Black Clawson Company
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Manchester Machine Co.
Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.
Waldron, John, Corp.

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Bauer Brothers Co.
Dilts Machine Works
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Hermann Mfg. Co.
Jackson & Church Co.
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sutherland Refiner Corp.
Valley Iron Works

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Bird Machine Company
General Electric Co.
Improved Paper Machinery Corp.
Johnson Corp.
Shartle Brothers Machine Co.
Taylor Instrument Companies
Westinghouse Electric Corp.
Poirier Control Company

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The Dow Chemical Company
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Reichhold Chemicals, Inc.

ROLLS
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
B. F. Goodrich Co.
Holyoke Machine Co.
Lindsay Wire Weaving Co.
Lobdell United Co.
Manchester Machine Co.
The Moore & White Co.
D. J. Murray Mfg. Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
J. J. Ross Company
Rice Barton Corporation
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Stowe-Woodward Inc.
U. S. Rubber Co.
Valley Iron Works Co.
Waldron Corp., John
Wheeler Roll Co.

ROLL COVERS
The Goodyear Tire & Rubber Company

ROLL HANDLING EQUIPMENT
Dilts Machine Works (Kohler Systems)

ROLL STANDS
Cameron Machine Co.
Clark-Aiken Co.
Dilts Machine Works (Kohler Systems)
Frank W. Egan & Co.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
John Waldron Corp.
H. G. Weber & Co., Inc.

ROPE CARRIERS
Black Clawson Co.
Downingtown Mfg. Co.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works

ROTARY KILNS
F. L. Smidth & Co.

ROTARY SCREENS
Chas. Mundt & Sons

ROTARY STEAM JOINTS
Johnson Corp.
The Moore & White Co.
Rice Barton Corporation
Shartle Bros. Mch. Co.

RUBBER LINING
B. F. Goodrich Co.

RUBBER PRODUCTS
The Goodyear Tire & Rubber Company

SATURANTS
B. F. Goodrich Chemical Co.

SATURATING MACHINES
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

SAVEALLS
Bird Machine Company
Chicago Bridge & Iron Co.
Improved Paper Machinery Corp.

SAWS
Simonds Saw & Steel Co.

SCALES
Merrick Scale Mfg. Co.
Testing Machines, Inc.

SCREEN PLATES
Bird Machine Company
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Mundt, Chas. & Sons
Testing Machines, Inc.

SCREENS
Appleton Wire Works
Appleton Machine Company
The Bagley & Sewall Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
Mundt, Chas. & Sons
D. J. Murray Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Trimbey Machine Works
Valley Iron Works Co.

SCREENS, CHIP (Vibrating)
Link Belt Co.

SCREENS (Perforated)
Mundt, Chas., & Sons

SCREENS (Rotary)
Mundt Chas., & Sons

SHAKES
Downingtown Mfg. Co.

SHAKE STICKS
Westinghouse Electric Corp.

SHEET MACHINES
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
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Testing Machines, Inc.
Valley Iron Works Co.
Williams Apparatus Co., Inc.

SHEET MACHINES—LABORATORY
Testing Machines, Inc.

SHOWER PIPES
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Moore & White Co.
Sandusky Fdy. & Mch. Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.
Gibbs-Brower Company, Inc.
Jackson & Church Co.
Jeffrey Mfg. Co.

SIZE PRESSES
Black-Clawson Co.
Downingtown Mfg. Co.
Manchester Machine Co.
Rice Barton Corporation

SIZING
American Bitumuls & Asphalt Co.
American Cyanamid Company, Industrial Chemicals Division
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
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Hercules Powder Co.
The Hubinger Co.
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Wyandotte Chemicals Corp., Michigan Alkali Div.

SIZING TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Williams Apparatus Co., Inc.

SLIME CONTROL
Buckman Laboratories, Inc.
The Dow Chemical Company
E. I. du Pont de Nemours & Co.
General Dyestuff Corp.
Magnuson Products Corp.
Monsanto Chemical Co.
National Aluminate Corp.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alakli Div.

SLITTERS
The Bagley & Sewall Company
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Clark-Aiken Co.
Dietz Machine Works
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
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Improved Machinery Inc.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Paper Converting Machine Co.
Rice Barton Corporation
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SMOKE STACKS
Chicago Bridge & Iron Co.

SOFTNESS-STIFFNESS TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SOLUBLE OILS
American Cyanamid Company, Industrial Chemicals Division
General Dyestuffs Corp.
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SPECIAL MACHINERY
Biggs Boiler Works Co.
Dilts Machine Works
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Jackson & Church Co.
Manchester Machine Co.
Paper Converting Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Waldron, John, Corp.

SPEED REDUCERS
Dodge Manufacturing Corp.
Downingtown Mfg. Co.
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SPLICING TISSUE
Williams-Gray Co.

STAINLESS STEEL
Armco Steel Corp.
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STARCH
Clinton Foods, Inc.
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STEAM JET EJECTORS
Elliott Company, Inc.

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The Moore & White Co.
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STEAM SPECIALTIES
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Chicago Bridge & Iron Co.
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STOKERS
Westinghouse Elec. Corp.

STRAINER SCREENS
Mundt, Chas., & Sons

STRAINERS
Elliott Company, Inc.

STRETCH TESTER
Testing Machines, Inc.
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Downingtown Mfg. Co.
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Rice Barton Corporation
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOX COVERS
Appleton Wood Products
Westinghouse Electric Corp.

SUCTION BOX TOPS
Mundt, Chas., & Sons

SUCTION BOXES
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
E. D. Jones & Son Co.
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Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

SUCTION ROLLS
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The Appleton Machine Co.
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American Cyanamid Company, Industrial Chemicals Division
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Cram & Associates
Poirier Control Company

TAILING SCREENS
Mundt, Chas., & Sons

TAKE OFF UNITS
Dilts Machine Works (Kohler Systems)

TALC
American Cyanamid Company, Industrial Chemicals Division
Vanderbilt Co., R. T.

TANKS
Chicago Bridge & Iron Co.
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B. F. Perkins & Sons, Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Stebbins Engrg. Co.

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Testing Machines, Inc.

TENSILE TESTERS
Thwing-Albert Instrument Co.
B. F. Perkins & Son, Inc.
Scott Testers, Inc.
Testing Machines, Inc.
A. van der Korput

THICKENERS, DECKERS AND SAVEALLS
The Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Chicago Bridge & Iron Co.
Dilts Machine Works
Downingtown Mfg. Co.
Improved Machinery Inc.
Moore & White Co.
D. J. Murray Mfg. Co.
Ross Paper Machinery Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

THICKENER SCREENS
Mundt, Chas., & Sons

TIRES
Stroh Process Steel Co.

TITANIUM
American Cyanamid Co., Calco Chemical Div.
E. I. du Pont de Nemours & Co
Titanium Pigment Co.
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Walworth Company

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Elwell Parker Elec. Co.

TRANSFORMERS
Westinghouse Elec. Corp.

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Dodge Mfg. Corp.
Jeffrey Mfg. Co.
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Crane Co.
Grinnell Company
Johnson Corporation
Shartle Brothers Machine Co.

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Elliott Company, Inc.

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TUBES
Babcock & Wilcox Co.
National Tube Co.

TUBING MACHINES
Dilts Machine Works

TUBING, MECHANICAL
National Tube Co.

TUBS
Shartle Brothers Machine Co.
Valley Iron Works Co.

TURBINES
De Laval Turbine Co.
Elliott Company, Inc.
General Electric Company
Westinghouse Electric Corp.

UNWINDERS
Clark-Aiken Co.
Dilts Machine Works (Kohler Systems)
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Rice Barton Corporation
Waldron, John, Corp.

USED EQUIPMENT
Gibbs-Brower Co.
Thomas W. Hall Co.
J. J. Ross Company
Ross Paper Machinery Co.
Shartle Brothers Machine Co.

V-BELTS
Dodge Mfg. Corp.
Goodrich, B. F., Company, Inc.

VALVES
The Bagley & Sewall Company
Crane Company
DeZurik Shower Co.
Dilts Machine Works
Downingtown Mfg. Co.
Grinnell Company
E. D. Jones & Sons Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
William Powell Co.
Record Fdy. & Mch. Co.
Rice Barton Research Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Walworth Company

VAPOR BARRIER COATINGS
Insul-Mastic Corp. of America

VATS
Biggs Boiler Works Co.
Black-Clawson Co.
Beloit Iron Works
Downingtown Mfg. Co.
Rice Barton Corporation

WASHERS
The Bagley & Sewall Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Improved Paper Machinery Corp.
Jackson & Church Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

WASTE CONVEYOR SCREENS
Mundt, Chas., & Sons

WASTE TREATING EQUIPMENT
Hungerford & Terry, Inc.
Jeffrey Mfg. Co.
Link Belt Co.

WATER CONDITIONING
Calgon, Inc.
General Dyestuff Corp.
Hungerford & Terry, Inc.
National Aluminate Corp.
The Sandy Hill Iron & Brass Works

WATER DISPERSIONS
American Cyanamid Company Industrial Chemicals Division
Naugatuck Chemical Division of U. S. Rubber Co.

WATER FILTERS
Bird Machine Co.
Holyoke Machine Co.
Improved Paper Machinery Corp.

WATER PENETRATION TESTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Williams Apparatus Co., Inc.

WATER SOFTENERS
Hungerford & Terry, Inc.
Wynadotte Chemicals Corp. Michigan Alkali Div.

WATER VAPOR CUPS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

WAXING MACHINERY
Black-Clawson Company
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
The Mayer Machine Co.
Paper Converting Machine Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WEB TENSION CONTROL
Dilts Machine Works (Kohler Systems)
Egan, Frank W., & Co.
Waldron, John, Corp.

WELDING EQUIPMENT
General Electric Company
Walworth Company
Westinghouse Electric Corp.

WELDING FITTINGS
Pittsburgh Piping & Equipt. Co.

WET MACHINES
The Bagley & Sewall Company
Black-Clawson Company
Carthage Machine Co.
Downingtown Mfg. Co.
Improved Paper Machinery Corp.
Moore & White Co.
Pusey & Jones Corp.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WET STRENGTHENING AGENTS
American Cyanamid Company Industrial Chemicals Division
Hercules Powder Co., Inc.
Reichhold Chemicals, Inc.

WETTING AGENTS
American Cyanamid Company Industrial Chemicals Division
Diamond Alkali Co.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Wyandotte Chemicals Corp. Michigan Alkali Div.

WHITE WATER TREATING EQUIPT
Bird Machine Co.
Hungerford & Terry, Inc.
The Sandy Hill Iron & Brass Works

WINDERS & REWINDERS
The Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Company
Cameron Machine Co.
Clark-Aiken Co.
Dietz Machine Works
Dilts Machine Works (Kohler Systems)
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Langston Co., Samuel M.
Manchester Machine Co.
Moore & White Co.
Paper Converting Machine Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rice Barton Corporation
Ross Paper Machinery Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron, John, Corp.

WINDING ROLL CHANGERS
Dilts Machine Works (Kohler Systems)
Egan, Frank W., & Co.
Waldron, John, Corp.

WIRE BRUSHES
M. W. Jenkins Sons, Inc.
Williams-Gray Co.

WIRE GUIDES
Black-Clawson Company
Gilbert & Nash

WIRES
Appleton Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Williams-Gray Co.
Wisconsin Wire Works

WOOD SPLITTERS
The Appleton Machine Co.
Carthage Machine Co.
Manchester Machine Co.

PAPER TRADE JOURNAL INDEX TO ADVERTISERS PAPER TRADE JOURNAL

A

Amercoat Corp. ....
American Bitumuls & Asphalt Co. ....
American Cyanamid Co., Calco Chemical Div. ....
American Cyanamid Co., Industrial Chemicals Div. ....
American Steel & Wire Co. ....
Antara Chem. Div., General Dyestuff Corp. ....
Apmew, Inc. ....
Appleton Machine Co., The ....
Appleton Wire Works, Inc. ....
Appleton Woolen Mills ....
Areo Drainage & Metal Products ....
Armco Steel Corp. ....
Armstrong Machine Works ....
Asten-Hill Mfg. Co. ....

B

Babcock & Wilcox Co. ....
Bagley & Sewall Co. ....
Bahr Bros. Mfg. Co. ....
Bailey Meter Co. ....
Barrell, Wm. L., Co. ....
Bauer Bros. Co. ....
Beloit Iron Works Co. ....
Bird Machine Co. 13
Bixby, R. W., Inc. ....
Black-Clawson Co. 6
Blaw-Knox Co. 56
Bolton, John W., & Sons, Inc. ....
Borden Co. ....
Bowser, Inc. ....
Bowsher, N. P., Co. ....
Brown Co. ....
Buffalo Pumps, Inc. 59
Bulkley, Dunton Processes, Inc. ....

C

Calgon, Inc. 2
Cambridge Instrument Co. ....
Cameron Machine Co. ....
Carthage Machine Co. ....
Chemiquip Process, Inc. ....
Chicago Bridge & Iron Co. ....
Ciba Company ....
Cities Service ....
Clark-Aiken Co. ....
Classified Advertising 51
Clearing House 51
Clinton Foods, Inc. ....
Columbia-Southern Chem. Corp. Sub. of Pittsburgh Plate Glass Co. ....
Corn Products Sales Co. ....
Cram H. G. Assoc. ....
Crane Co. 35
Crucible Steel Corp. of America 29

D

Davis, Frank H., Co. 51
De Laval Steam Turbine Co. ....
Denver Equipment Co. ....
DeZurik Shower Co. ....
Diamond Alkali Co. ....
Dietz Machine Works ....
Dilts Machine Works 6
Dodge Manufacturing Co. ....
Dow Chemical Co. ....
Downingtown Mfg. Co. ....
Draper Brothers Co. ....
du Pont, E. I., de Nemours & Co. Electrochemical Dept. ....
du Pont E. I., de Nemours & Co. Dyestuffs Dept. ....
du Pont E. I., de Nemours & Co. Grasselli Chem. Dept. ....
du Pont E. I., de Nemours & Co. Polychemicals Dept. ....

E

Elasco Services, Inc. ....
Elderer Engrg. Co. ....
Egan, Frank W., & Co. 46
Elixman Paper Core Co. ....
Elliott Co. 25
Elwell Parker Elec. Co. ....
English China Clays Sales Corp. 48
Eriez Mfg. Co. ....

F

Farrel-Birmingham Co., Inc. ....
Ferguson, The H. K., Co. ....
Fitchburg Screen Plate Co. ....

G

Geigy Co. ....Front Cover
General Dyestuff Corp. ....
General Electric Co. .... 32 & 33
Gibbs Brower Co. 53
Glidden Co. ....
Goodrich Chemical Co. ....
Goodrich Co., B. F. ....
Goodyear Tire & Rubber Co. ....
Goslin-Birmingnam Mfg. Co. ....
Gottesman & Co. ....
Grinnell Co., Inc. ....
Gulf Oil Co. ....
Gurley, W. & L. E. ....

H

Hall, Thomas W., Co., Inc. 53
Hamblet Machine Co. ....
Hardinge Co., Inc. ....
Hayden Wire Works ....
Heinrich, H. H., Co. ....
Hercules Powder Co. ....
Hermann Manfg. Co. 55
Heyden Chemical Co. ....
Holyoke Machine Co. ....
Hooker Electrochemical Co. ....
Huber, J. M., Corp. ....
Hubinger Co., The ....
Hudson Sharp Machine Co. ....
Huyck, F. C., & Sons ....

I

Improved Machinery, Inc. ....
Insulmastic Corp. of America ....
International Nickel Co. ....
International Wire Works ....

J

Jackson & Church Co. ....
Jeffrey Mfg. Co. ....
Jenkins M. W., Sons, Inc. ....
Johnson Corp., The 3
Johnson, Alvin H. & Co. 46
Jones, E. D., & Sons Co. ....

K

Kalamazoo Sheet Metal & Mfg. Co. ....
Kinsley Chemical Co. ....
Knox Woolen Co. ....
Koppers Co., Inc. 41

L

Langston, Samuel M., Co. 63
Leffel, James & Co. ....Back Cover
Lindsay Wire Weaving Co. 49
Link Belt Co. ....
Lobdell United Co. ....
Lockport Felt Co. 10
Lodding Engineering Co. ....
Lukens Steel Co. 23
Lyddon Co. ....
Lynch Corp. ....

M

Magnus Metal Div., Nat. Lead Co. ....
Main, Charles T., Inc. 50
Manchester Machine Co. ....
Mead Board Sales, Inc. ....
Mead Sales Co., The ....
Mercer Paper Tube Co. 50
Merrick Scale Co. ....
Michigan Steel Casting Co. 46
Midwest Fulton Machine Co. 4
Mixing Equipment Co. ....
Monsanto Chemical Co. ....
Moorhead Electrical Machinery 53
Morden Machines Co. ....
Morey Paper Mill Supply Co. ....
Mount Hope Machinery Co. ....
Murray, D. J., Mfg. Co. ....
Mundt, Charles, & Sons ....

N

Nash Engineering Co. 47
National Aluminate Corp. ....
National Starch Products, Inc. ....
National Tube Co. 27
Naylor Pipe Co. ....
Neff & Fry Co. ....
Niagara Alkali Co. 31
Nichols Engrg. & Research Co. ....
Nopco Chemical Co. ....
Nordicus, Inc. ....
Nordstrom Valve Div. of Rockwell Mfg. Co. ....
Norton Company 46

O

O'Donoghue, Roderick ....
Oldbury Electric Chem. Co. ....
Owen Bucket Co. ....

P

Pandia, Inc. ....
Parsons & Whittemore ....
Peabody Engineering Co. ....
Perkins, B. F., & Sons Co. ....
Perkins Goodwin Co. ....
Pioneer Paper Stock Co. ....
Pittsburgh Piping & Equip. Co. ....
Poirier Control Co. ....
Powell, William, Co. ....
Price & Pierce, Ltd. 54
Pulp & Paper Trading Co. ....
Pulp Sales Corp. ....
Pusey & Jones Corp., The ....

R

Railway Supply & Mfg. Co. 43
Raymond, Chas. P., Service, Inc. 51
Record Fdy. & Machine Co. 58
Red Ray Manufacturing Co., Inc. ....
Reichhold Chemicals, Inc. ....
Reliance Elec. & Engrg. Co. 16
Research Corp. ....
Restigouche Co., Ltd. 46
Rice Barton Corp. ....
Reidel, Gus, & Son ....
Rockwell Mfg. Co. ....
Rogers, S. C., & Co. ....
Roosevelt Paper Co. ....
Roots-Connersville Blower Div. ....
Ross, J. J., Co. ....
Ross Paper Machinery Co. 52
Ross Paper Machinery Co. ....
Rust Engineering Co. ....

S

Sandusky Fdy. & Mch. Co. ....
Sandy Hill Iron & Brass Works ....
Seaboard Air Line R.R. Co. ....
Shartle Bros. Machine Co. 6
Shuler & Benninghofen 37
Simonds Saw & Steel Co. ....
Sinclair Refining Co. ....
Sirrine, J. E., Co. ....
Smidth, F. L., & Co. 39
Smith, A. O., Corp. ....
Smith & Winchester Mfg. Co. ....
Socony Vacuum Oil Co., Inc. ....
Sonoco Products Co. ....
Spray Engineering Co. ....
Stebbins Engrg. & Mfg. Co. ....
Stowe-Woodward ....
Sun Oil Co. ....
Sutherland Refiner Corp. ....
Swenson Evaporator Co. ....

T

Taylor Instrument Cos. ....
Taylor Machine Works ....
Taylor Stiles & Co. 46
Tennessee Coal, Iron & R. R. Co. 27
Testing Machines, Inc. ....
Testworth Laboratories ....
Texas Co., The ....
Texas Gulf Sulphur Co. ....
Thiele Kaolin Co. ....
Thomas Paper Stock Co. 58
Thwing-Albert Instrument Co. ....
Timken Roller Bearing Co. ....
Titanium Pigment Corp. ....
Torrington Co. ....
Towmotor Corp. ....
Tracerlab, Inc. 57
Tupman-Thurlow Co. ....

U

United Carbon Co., Inc. ....
United States Steel Export Co. 27
United States Steel Supply Co. 27
U. S. Rubber Co. ....
U. S. Steel Co. 27

V

Valley Iron Works Co. ....
Vanderbilt, R. T., Co. 8
Vanderkorput, A. 59
Virginia Smelting Co. ....
Vulcan Copper & Supply Co. ....

W

Waldron, John, Corp. ....
Walworth Co. ....
Waterbury Felt Co. ....
Wellman Engineering Co. ....
Westinghouse Electric Corp. ....
West Virginia Pulp & Paper Co. 54
Weyerhaeuser Timber Co. ....
Whiting Corp. ....
Williams Apparatus Co. ....
Williams Gray Co. ....
Wisconsin Wire Works ....
Wyandotte Chemicals Corp. ....

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Francis J. Gordon
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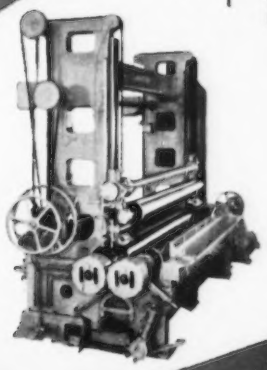
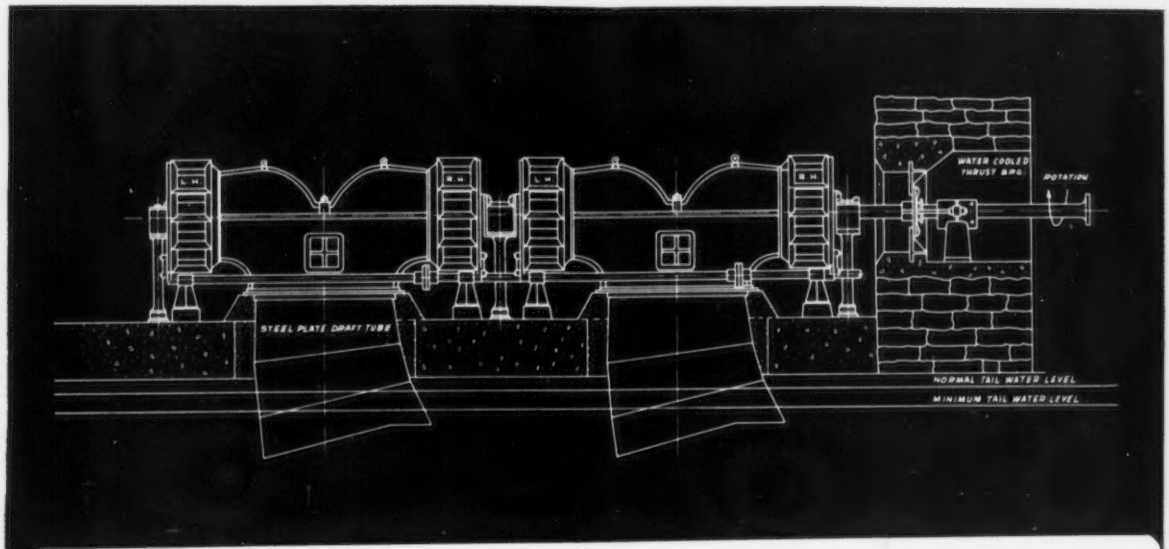




LEFFEL *Powers* the Paper Industry

Leffel has sold hydraulic turbines to practically every paper and pulp maker in the United States and Canada which produces its own power from water.

In almost no other thing they buy can paper makers draw on experience, *proved in their own industry*, such as that. In other industries, Leffel water-wheels have proved themselves up to the hilt. But it is in paper-making—*your* industry—where Leffel wheels have made good in such an overwhelming fashion.

Paper usually calls for special turbine design, special installation technique. Leffel engineers have blueprinted hundreds and hundreds of them. The Leffel shops have produced them.

Successfully? Ask your neighboring paper maker. The chances are he's got at least one Leffel wheel . . . and *if he has it he likes it.*

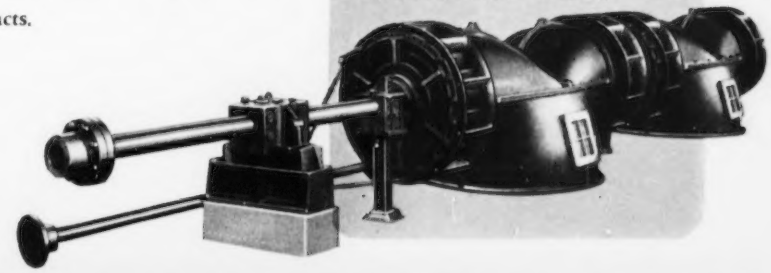
When you build a new pulp or paper mill, or if you need more power in an older mill, specify Leffel turbines. You'll find that paper machinery manufacturers like Leffel drive equipment. They know Leffel has built good turbines since 1862. They know a Leffel turbine will help their equipment deliver more power more reliably.

Drop a line to us for helpful facts.

Leffel turbines furnish power for these famous names in paper

International Paper Company
Penobscot Chemical Fibre Company
West Virginia Pulp & Paper Company
American Writing Paper Company
Escanaba Paper Company
Claremont Paper Corporation
Brownville Board Company
Kimberly-Clark Corporation
Gould Paper Company
Missisquoi Corporation
Fox River Paper Corporation
Combined Locks Paper Company
Marinette Paper Company
Neenah Paper Company
Nekoosa Edwards Paper Co., Inc.
Rhinelander Paper Company

The blueprint at the top of this page is a typical Leffel turbine paper mill installation diagram, prepared by Leffel engineers for a customer. At the right, below, is the special paper mill turbine diagrammed in the blueprint. Four wheels, two draft chests. All parts, including the large draft-chest castings, were produced in our plant.



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